American Innovations Allegro CX
Version 4.3.2

User Guide

AMERICAN INNOVATIONS

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July 19, 2011 Part No. 122141-000, Rev. 3

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1 Getting Started

This guide explains how to set up and use American Innovations' software installed on the Allegro CX Field PC®.

Topics in this chapter include those in the following list:

- Equipment List (page 1)
- Preparing the Allegro for Use (page 2)
- Overview of AI's Allegro Software (page 13)
- Overview of the Allegro Hardware (page 10)
- System Tray Icons (page 18)
- Contacting Technical Services (page 20)

Equipment List

Your Allegro ships from American Innovations (AI) with the following items. Several optional add-ons are available for purchase, such as GPS (global positioning system). For a complete list contact AI Sales at 1-800-229-3404.

Items provided in the box with the Allegro include:

- Rechargeable Battery Pack and AC Charger
- Serial Communication cable (female/female 9-pin, null modem cable)
- Mini Stylus and Pen-Style Stylus

- Hand Strap and Shoulder Strap
- Screen Protector
- AI Allegro CD with copies of AI software, user guide, release notes, and upgrade procedures
- Microsoft *Getting Started* CD with Windows Mobile Device Center and ActiveSync
- Juniper Systems CD with owner's manual and quick start guide

Preparing the Allegro for Use

When you first receive the Allegro from AI, perform the following tasks to prepare the device for service:

- Install the Battery Pack (see page 2)
- Set Display Properties for a Monochrome Display (see page 4)
- Set Regional Settings, Time Zone, and Date/Time (see page 5)
- Install Windows Mobile Device Center or ActiveSync (see page 6)
- Transfer Utility Files to PCS (see page 9)

Install the Battery Pack

Complete the following steps to install and charge the battery pack. Charge the battery pack for at least six hours.

1. Push the sliding latches up on the sides of the Allegro to open the battery compartment door (Figure 1-1).

Figure 1-1. Slide Latches

2 Place the battery pack in the battery compartment with the small arrow pointing to the right (Figure 1-2). Push the battery pack down and then slide it to the right to secure it in place.

Figure 1-2. Install Battery Pack

3 Push the battery door closed until slide latches click into place. If slide latches are not securely in place, the unit is no longer water tight.

4 Plug the battery charger into a wall outlet, then the Allegro (Figure 1-3). The *Set Battery Parameters* window (Figure 1-4) automatically displays after applying power.

Figure 1-3. Connect Battery Charger

5 Complete the following settings in the *Set Battery Parameters* window (Figure 1-4):

- Set charge percentage to **10%** in the field *Enter new Battery Charge Level (%)*.
- Set *Battery Capacity* to **4000** and then tap Accept to close the window.

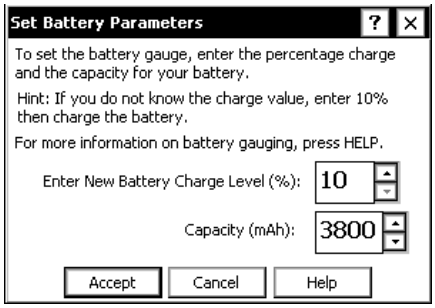


Figure 1-4. Set Battery Parameters

Set Display Properties for a Monochrome Display

If the Allegro includes a monochrome display, complete the following steps to set display properties:

1 Tap **Start** > **Settings** > **Control Panel** > **Display** icon.

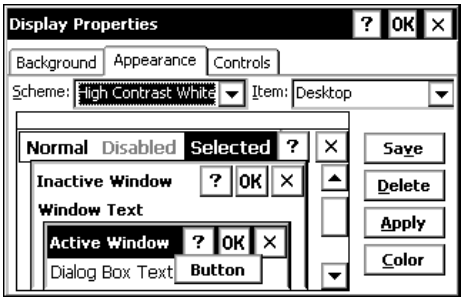


Figure 1-5. Display Properties

2 Tap the **Appearance** tab (Figure 1-5). Select **High Contrast White** in the *Scheme* field and **Desktop** in the *Item* field.

3 Tap **OK** and then the Close icon (**X**) to return to the Allegro desktop.

Set Regional Settings, Time Zone, and Date/Time

Regional settings specify the style that date/time, numbers, and currency are displayed. After selecting a display style, set up the Allegro with your preferred time zone, date, and time.

Complete the following steps:

1. Tap **Start** > **Settings** > **Control Panel** > **Regional Settings** to display the *Regional Settings Properties* window (Figure 1-6).

2. Set your preferred language *Your Locale*. Use the remaining tabs to set the display style for *Number*, *Currency*, *Time*, and *Date*. Click **OK** to return to the *Control Panel* window.

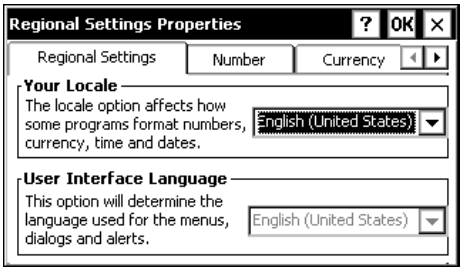


Figure 1-6. Regional Settings

3. Tap the **Date/Time** icon in the *Control Panel* window and complete the following settings:

   - Set up the *current date*, *time*, and your preferred *time zone*. If Daylight Savings Time applies to your preferred time zone, tap **Daylight savings time in effect** to enable this option.

   - Tap **OK** to apply settings and close the window. Tap the Close icon (**X**) to return to the Allegro desktop.

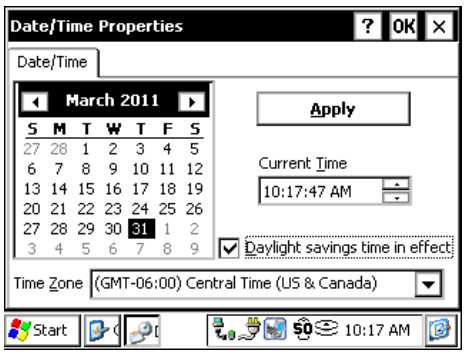


Figure 1-7. Time Zone and Date/Time

Install Windows Mobile Device Center or ActiveSync

The Allegro communicates with a computer using either Windows Mobile Device Center (for Windows 7 and Vista) or Microsoft ActiveSync (for Windows XP or 2000).

If your computer is not installed with Windows Mobile Device Center (WMDC) or ActiveSync, complete the following steps to install the software. View your computer's *Start Menu* to determine if the software is installed (*Start* > *Program Files* or *Programs)*.

Windows 7/Vista: Install Windows Mobile Device Center

If your computer is running Windows 7 or Windows Vista, complete the following steps:

1. Insert the *Getting Started* CD in the CD drive of your computer. The CD is included with the Allegro. If you cannot locate the CD, please contact Technical Services at pcstechservices@aiworldwide.com.

2. Plug the provided serial cable in the Allegro and your computer.

3. Download the *Windows Mobile Device Center Installer* to your computer by clicking the download link that appears in the pop-up window.

4. Select **Run this program from its current location** and click **OK**. Follow on-screen prompts to install the software.

5. Create a connection at anytime by connecting one end of the serial cable in your computer and the other end in the Allegro. WMDC automatically opens (Figure 1-8). Click **Connect without setting up your device** to create a connection.

Figure 1-8. Windows Mobile Device Center

Windows XP/2000: Install ActiveSync

If your computer is running Windows XP or Windows 2000, complete the following steps:

1. Insert the *Getting Started* CD in the CD drive of your computer. The CD is included with the Allegro. If you cannot locate the CD, please contact Technical Services at pcstechservices@aiworldwide.com.

2. Follow on-screen prompts to install ActiveSync.

3. To establish a sync connection with the Allegro and your computer, follow these steps:

   a Connect the serial cable to your computer and the Allegro.

   b When *Synchronization Setup Wizard* displays, click **Cancel** when prompted to create a sync partnership. Clicking *Cancel* allows you to create a *Guest* connection instead (Figure 1-9).

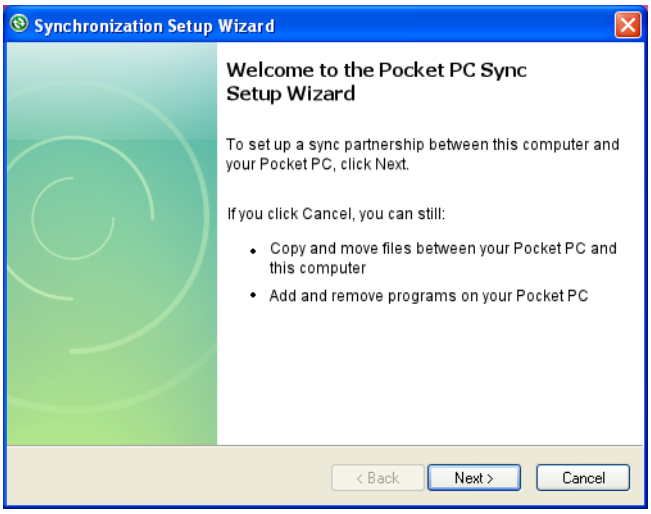


Figure 1-9. Synchronization Setup Wizard

A successful sync connection occurs when the following ActiveSync window displays (Figure 1-10).

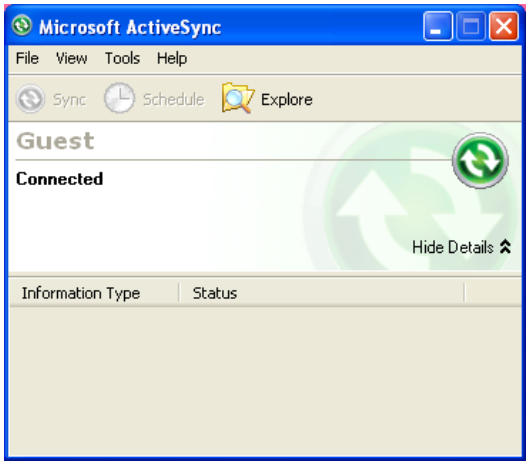


Figure 1-10. ActiveSync Connected

NOTE: If a successful sync connection *does not* occur and you also use a VPN (virtual private network) software to establish a remote connection with a private network: (1) Disable or disconnect the VPN software. (2) Recycle power to the Allegro and your computer. (3) Click **Cancel** when *Synchronization Setup Wizard* displays. If a sync connection has not been established, contact Technical Services at pcstechservices@aiworldwide.com.

Transfer Utility Files to PCS

If you use Pipeline Compliance System (PCS) with the Allegro, complete the following steps to transfer two utility files from the Allegro installation CD to the PCS CPDM installation directory on your computer. The utility files are labeled *wToCmd.exe* and *CeFileXer.exe* on the Allegro installation CD.

IMPORTANT: PCS typically installs in the CPDM installation folder on C: drive of your computer (C:\CPDM). If you installed PCS in a different folder, locate the folder by searching for either of the utility files. Click the Windows *Start* button and then type *wToCmd.exe* or *CeFileXer.exe* in the *Search* field to locate the utility files and PCS CPDM installation folder.

Complete the following steps:

1. Insert the Allegro installation CD in your computer's CD drive.
2. Open Windows Explorer and view the contents of the CD folder labeled *PCS Files* on the installation CD.
3. Drag the files *wToCmd.exe* and *CeFileXer.exe* from the installation CD to the PCS CPDM installation folder on your computer (Figure 1-11).
4. Click **Yes** or **Move and Replace** to update existing files when Windows displays the *Move File* message.

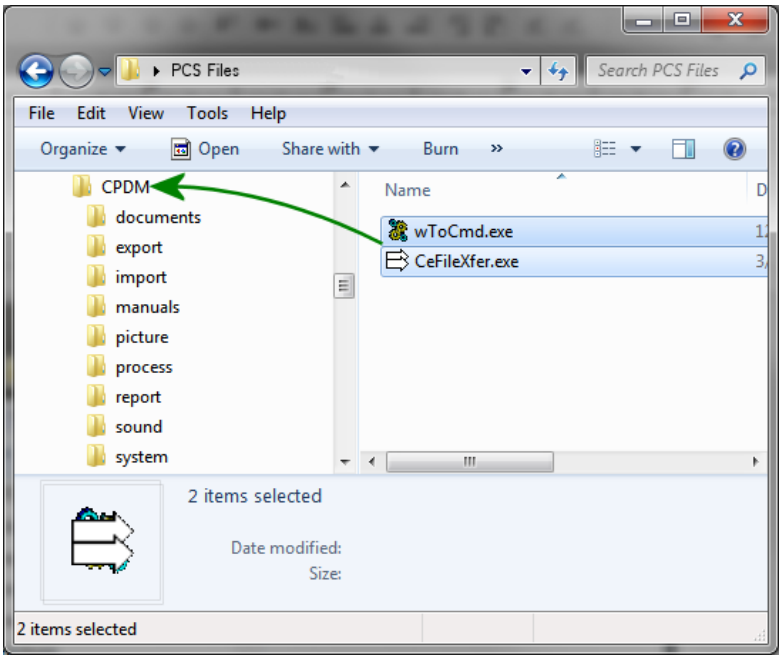


Figure 1-11. PCS CPDM Installation Folder

Overview of the Allegro Hardware

The Allegro includes a connector panel, touchscreen display, keypad, and function keys (Figure 1-12). Optional add-ons available for purchase include a GPS expansion pod with GPS antenna and a Trimble GPS receiver. For a complete list of add-ons available for purchase, contact AI Sales at 1-800-229-3404.

Figure 1-12. Allegro Field PC

Connector Panel

The connector panel is located at the top of the Allegro (Figure 1-13). It supports connections for items in the list below.

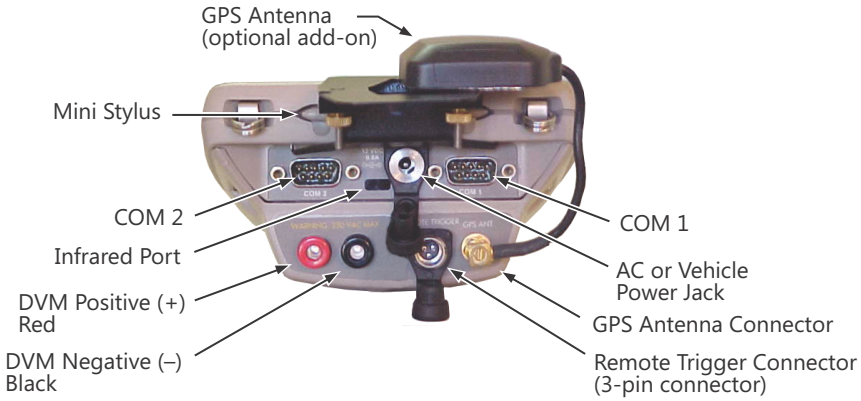


Figure 1-13. Allegro Connector Panel

The connector panel supports the following connections:

- DVM positive and negative test leads.
- Remote trigger for data cane or wire counter (3-pin connector).
- Communication ports with the following characteristics:
  - Infrared port for wireless communication with a printer or computer using ActiveSync.
  - USB port for connecting to an optional USB power dock.
  - Two 9-pin serial communication ports labeled COM1 and COM2
- AC or optional vehicle power adapter
- GPS expansion pod (optional add-on)
- GPS antenna (optional add-on)

Chainer/Stick Adapter Switch

A hardware switch inside the Allegro must be set before taking survey readings. Use the procedure below to set the switch in *Chainer* mode if using a data cane to take survey readings. If using a wire counter instead, set the switch in *Stick Adapter* mode.

To set the Allegro in either *Chainer* or *Stick Adapter* mode, follow these steps:

1. If the Allegro is on, press the power button to turn **Off** the device.
2. If a GPS antenna cable is connected to the Allegro, disconnect the cable.
3. Use a coin or flathead screwdriver to loosen two screws securing the card slot door on the back of the Allegro. Turn screws counter-clockwise ¼ of a turn to release the door.

Figure 1-14. Open Card Slot Door

4. Open the card slot door and set the switch in one of the following positions (Figure 1-15). When you finish, close and fasten the door.
   - *Chainer:* if using a wire counter, select *Chainer*.
   - *Stick Adapter:* if using a data cane, select *Stick Adapter*.

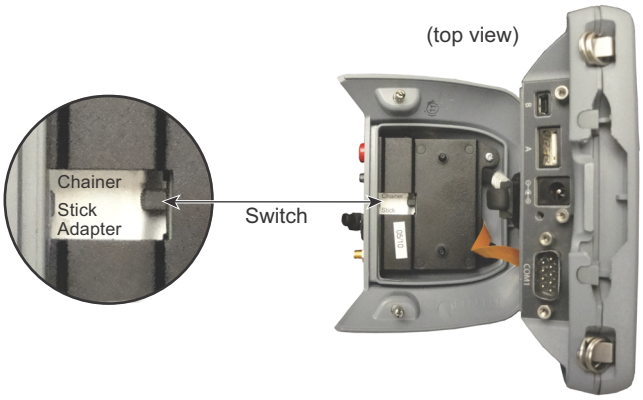


Figure 1-15. Set Chainer/Stick Adapter Switch Position

Overview of AI's Allegro Software

The Allegro ships from AI with the following AI Allegro software factory-installed. AI Allegro software version 4.3.1 is compatible with all version 6 and 7 PCS software.

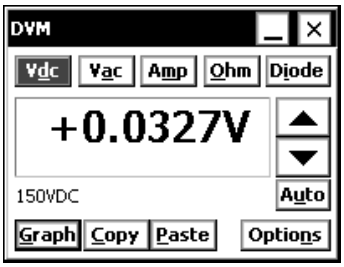
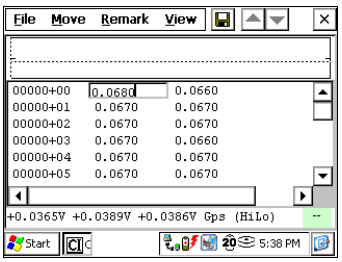
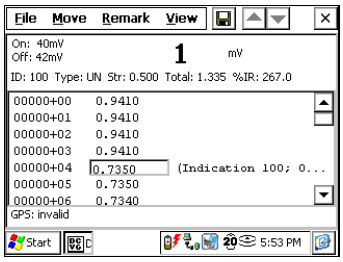
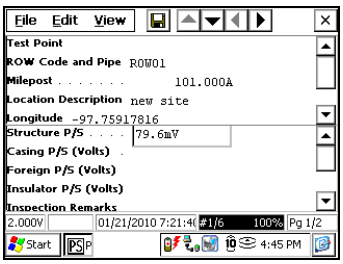
Digital Voltmeter (AiDvm)	Close Interval (CeCi)
	
Measures voltage, current, and resistance levels.	Records potential readings for close interval (CI) surveys.
DC Voltage Gradient (DCVG)	**Periodic Survey**
	
Records indications of pipeline coating defects.	Records voltage readings for annual and periodic surveys.

Figure 1-16. AI Allegro Software Overview

Touchscreen Display

Use the provided stylus to tap the touchscreen and activate a software program or make a selection. Several system icons are available for selection that allow you to navigate.

IMPORTANT: Avoid using sharp objects that may scratch or puncture the touchscreen display.

The Allegro includes a high-contrast, pressure-sensitive display with an adjustable backlight and heater for cold weather operation. When working in harsh conditions, such as a rainstorm or in high brush, pressing the **BLUE** shift and **TS** buttons toggles the touchscreen on or off.

A display heater is included with the Allegro monochrome display to ensure effective operation throughout different temperature ranges. The heater automatically turns on at 20 °F and turns off when the temperature is above 20 °F. Allegro color units do not require a heater because the unit operates effectively in all temperatures. The monochrome version of the Allegro displays best when the device is set up with the *High Contrast* theme. See *Set Display Properties for a Monochrome Display* on page 4 for instructions.

Recalibrate the Touchscreen Display

If the touchscreen does not respond accurately to stylus taps, recalibrate the touchscreen manually using the following steps:

1. Tap **Start** > **Settings** > **Control Panel** > **Stylus** > **Calibration** tab.
2. Tap **Recalibrate** (Figure 1-17) and then follow on-screen prompts to recalibrate the touchscreen.

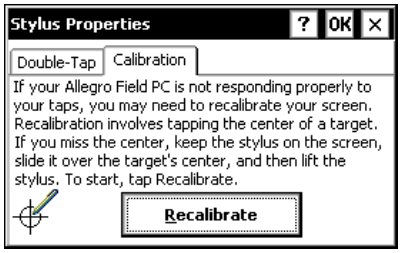


Figure 1-17. Recalibrate Touchscreen

3. When the process completes, tap **OK** to close the window and then tap the *Close icon* (**X**) to return to the Allegro desktop.

Keypad and Shortcut Keys

The Allegro keypad is similar to a computer keyboard (Figure 1-18). The keypad provides the following functionality:

- Alphanumeric and symbol keys for data entry.
- Tab, Enter, Spacebar, and Circular keys for moving the cursor.
- F1 through F5 keys perform softkey operations in certain software programs. These keys perform special functions when used in conjunction with either the Blue or Gold key.

Figure 1-18. Allegro Keypad

The table on the next page (Table 1-1) provides a list of global shortcut keys. Use the Allegro keypad to run any of the identified commands.

Table 1-1. Global Shortcut Keys

Command	Shortcut Keys	Description
Toggle Caps	<**Blue**><**CapLk**>	Toggles caps lock on and off
Display Backlight	<**Gold**><**F3**>	Toggles backlight on/off.
Brighten/Dim Screen Display	<**Gold**><**F4**> <**Gold**><**F5**>	Press <Gold><F4> to dim screen display. Press <Gold><F5>to brighten screen display.
Move between fields	<**TAB**>	Moves cursor between fields. Left tab arrow moves cursor forward one field; right tab arrow moves cursor backward one field.
Close Window	<**Esc**>	Close an open window.
Enable/Disable Touchscreen	<**Blue**><**TS**>	Disable or enable the touchscreen.
Task Manager	<**Start**>	Displays the Task Manager.

Table 1-2. Button and Button Sequence Functionality

Button or Button Sequence	Description
Alt button + tap touchscreen	Desktop shortcut menu (similar to right-mouse click on PC)
Gold key + F5	Display Contrast Darker (monochrome display only)
Gold key + F4	Display Contrast Lighten (monochrome display only)
Blue key + TS	Enable / Disable touchscreen

Table 1-2. Button and Button Sequence Functionality

Button or Button Sequence	Description
Blue key + End	End
Gold key + Function key	Function keys F11 and F12
Blue key + Function key	Function key F6 through F10
Blue key + Home	Home
Blue key + PgDn	Page Down
Blue key + PgUp	Page Up
Gold key + Circular key up, down, right, or left arrow	Pan display in direction of arrow
Warm Reset/Soft Reboot: Press and hold On/Off key for about 8 seconds. Release the key when the restart process begins.	Reset Allegro
Press Tab arrow to move cursor between fields.	Tab forward or backward
Press Task Manager (Start) key to view all running programs.	Task Manager
Gold key + INS	Toggle auto-panning on/off
Blue key + Start	View Start Menu

System Tray Icons

The system tray appears in the bottom right area of the Allegro desktop. See the next table for a description of the various icons that display in the system tray.

Table 1-3. System Tray Icons

Icon	Description
	Remaining Battery Charge Status: shows percentage of charge remaining in battery.
	External Power Input: indicates external power source is connected and not drawing power from internal battery pack.
	Charging Indicator: appears in system tray when rechargeable batteries are being recharged.
	Data Storage Idle: outlined when solid state disk is idle and not being read from or written to.
	Data Storage Active: darkens when data is being read from or written to the solid state disk.
	PC Card: indicates a PC card is installed in the Allegro.
	PC Card Activity: indicates software program is accessing PC card. Do not remove card when this icon is visible in system tray.
	Caps Lock On: appears when the all capital letters option is activated. Press Blue shift and Shift/CapLk keys to activate option. Press again to deactivate option.
	Touchscreen Disabled: appears when touchscreen is disabled. Press Blue shift and TS keys to enable or disable touchscreen.
	PC Connection: appears when there is an active connection between the Allegro and desktop or laptop computer.

Table 1-3. System Tray Icons (continued)

Icon	Description
	Heater (monochrome screen only): appears when touchscreen heater turns on.
	Bluetooth Connection: appears when Bluetooth is being actively used on the Allegro.

Contacting Technical Services

If you need assistance with the AI software or Allegro, or have a comment or suggestion about this manual, contact Technical Services in any of the following ways:

Telephone: 1-800-229-3404 (select 1, then press 2)

E-mail: pcstechservices@aiworldwide.com

Mail: American Innovations, Ltd.
Attn. Allegro Technical Services
12211 Technology Blvd.
Austin, TX 78727

Notes

2 Digital Voltmeter (AI-DVM)

Ai-DVM measures voltage, current, resistance, and diode capacitance as a fully functional digital voltmeter (DVM) and as an integrated DVM to complement the following AI software: CeCi (close interval), DCVG (direct current voltage gradient), and Periodic Survey (annual/periodic survey).

You can view measurements either in the main window of AI-DVM or as a waveform graph. Optional settings are available for measuring current interrupter on/off potentials and operating in *GPS Sync* mode when using GPS-synchronized current interrupters.

Information in this chapter explains how to set up and use AI's digital voltmeter, AI-DVM. Topics include:

- Safety Precautions (page 23)
- Quick Start (page 24)
- DVM Graph Overview (page 27)
- Data Logger Overview (page 28)
- Shortcut Keys (page 29)

Safety Precautions

Observe the following safety precautions when using AI-DVM:

- Follow safety procedures for the equipment being tested. Inspect test leads for damaged insulation or exposed metal. Check test lead continuity. Damaged leads should be replaced.
- To avoid electrical shock and damage to the Allegro, do not use the Allegro when working with voltages greater than that supported by the DAQ (data acquisition) card or measuring current, except across a shunt.
- To avoid electrical shock and damage to the Allegro, remove test leads before replacing the Allegro battery **or** connecting to a desktop or laptop computer. Set up the Allegro with the correct test function and voltage range.

Quick Start

This section provides quick start procedures for setting up and using AI-DVM. As a user you will perform the following actions:

- Connect test leads to the Allegro (page 24)
- Set test function, voltage range, and sample rate (page 24)
- Set properties to measure on/off potentials (page 25)
- Set GPS properties (page 25)
- Set properties to measure current across an external shunt (page 25)
- Set data logger properties (page 26)

Connect test leads to the Allegro

1. Plug test leads in the red positive (**+**) and black negative (**–**) jacks on the Allegro connector panel; positive to positive, negative to negative (Figure 2-1).
2. Click the **AI-DVM** icon on the Allegro desktop to display the main AI-DVM window (Figure 2-1).

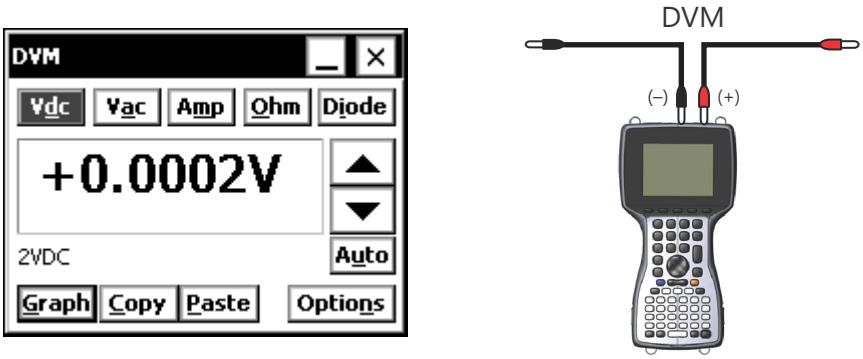


Figure 2-1. AI-DVM Main Window

Set test function, voltage range, and sample rate

1. Choose a test function by tapping **Vdc**, **Vac**, **Amp**, **Ohm**, or **Diode**.
2. Set the voltage range either manually by tapping the up or down arrow buttons or, tapping **Auto** to use autoranging instead.
3. Tap **Options**. If using autoranging, tap the drop-down arrow in the *Minimum range* field and select a minimum voltage range.
4. Tap the drop-down arrow in the *Sample rate* field and select either **50 Hz (European Standard)** or **60 Hz (US Standard)**. Click **Ok** to save settings and return to the main DVM window.

Set properties to measure on/off potentials

1. Verify **Vdc** is selected in the main DVM window and then tap **Options**.
2. Tap the **On/Off** tab.
3. Tap **Enable On/Off mode** and then select **HiLo** or **Gps-Sync** in the *Method* field. Select *HiLo* when using a non-GPS current interrupter(s) in an interrupted survey. If using a GPS synchronized current interrupter(s), select **Gps-Sync** instead.
4. Set up remaining fields with the same settings as those used by the current interrupter(s).
5. Tap **Ok** to save settings and return to the main DVM window.

Set GPS properties

1. Tap **Options** in the main DVM window and then tap the **GPS** tab.
2. If using the Allegro GPS internal module (optional add-on), verify *Comm Port* is **COM3 (internal)** and *Baudrate* is **9600**.

   The option *Read PPS from Internal GPS* is unavailable for selection when using the Allegro internal GPS module. AI-DVM automatically uses the PPS timing signal received by the internal GPS module.
3. If using dual GPS (optional add-on), follow these steps to set up AI-DVM:
   - **a** Set communication parameters (*Comm Port* and *Baudrate*) for a second GPS receiver connected in COM 1 of the Allegro.
   - **b** If you want to use the PPS timing signal received by the Allegro internal module instead of the second GPS receiver, tap **Read PPS from Internal GPS**.
4. Tap **Ok** to save changes and return to the main DVM window.

Set properties to measure current across an external shunt

1. Tap **Amp** in the main DVM window.
2. Set the voltage range either manually by tapping the up or down arrow buttons or, tapping **Auto** to use autoranging instead.
3. Tap **Options** > **Amps Mode** tab.

4 Complete one of the following steps:

   a Tap **as R value** and enter a shunt resistance value in the *Resistance* field.

   -or-

   b If you want AI-DVM to automatically calculate shunt resistance, tap **as Amp/ mV values** and enter a shunt size in the *mV* and *Amps* fields.

5 Tap **Ok** to save changes and return to the main DVM window.

Set data logger properties

1 Tap **Options** in the main DVM window and then the **Data Logger** tab.

2 Tap **Enable logging**.

3 Set a time interval by tapping the drop-down arrow in the first *Update interval* field and selecting a value (1-50). Tap the drop-down arrow in the second *Update interval* field and select a measurement of time (seconds, minutes, or hours).

IMPORTANT: When recording an hour or more of data, use the external AC power adapter to prevent draining the Allegro battery. The automatic power-down feature of the Allegro is disabled during data logging.

---

4 Tap **Browse** to display the *Save As* window and complete the following steps:

   a Type a name for the file in the *Name* field

   b Tap the drop-down arrow in the *Type* field and choose a file format.

   c Tap **OK** to save settings and close the *Save As* window.

5 Tap **Append** to include all readings in the file with the most recent reading at the end of the file.

6 Tap **Timestamp** to include a time stamp with each reading.

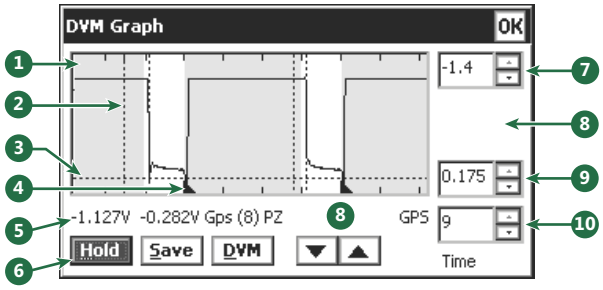
7 Tap **OK** to save settings and start a data logging session. *DVM - Logging* displays in the AI-DVM title bar. To stop the data logging session, tap **Options** > **Data Logger** tab > **Enable logging**.

8 Tap **Ok** to save changes and return to the main DVM window.

DVM Graph Overview

AI-DVM displays the on/off interruption cycle in real-time as a waveform graph in addition to the digital display in the main DVM window.

When using AI-DVM during an on/off survey, tap **Graph** to view a waveform graph of the interruption cycle (Figure 2-2).



1. Shaded area represents *on* cycle; non-shaded area represents *off* cycle.
2. Vertical dotted line indicates recorded reading.
3. Horizontal dotted line indicates zero (0) volts.
4. Black triangles indicate start of the *on* cycle.
5. Status line with current reading, voltage range, and number of GPS satellites in view.
6. **Hold**: Tap to stop or start scrolling data.

   Save: Tap to display Data Remarks window and save graph. Use Data Remarks to add notes in a graph. Graph saves as a text file and includes any added notes.

   DVM: Tap to close graph and return to DVM window.

   Up/Down Arrows: Tap to set the voltage range (20mV, 200mV, 2V, 25V, or 150 or 250V).
7. Sets upper voltage range.
8. Tap in the white space area to view real-time settings.
9. Sets lower voltage range.
10. Sets graph X-axis in seconds. Maximum is 60 seconds.

Figure 2-2. DVM Graph

The graph includes a status line below the reading. The status line identifies the voltage range, test function, and on/off method. If setup includes *GPS Sync* mode, the status line also identifies the number of satellites in view.

For example, a status line of *25VDC DGPS (5) PZ* indicates the following information:

- **25VDC**: voltage range and test function
- **DGPS**: differential GPS is available
- **(5)**: number of satellites in view
- **P**: PPS time signal has been received
- **Z**: ZDA message has been received

Other indicators that may appear in the status line include those in the following list:

- **GPS (n)**: indicates GPS and the number of satellites in view
- **HiLo**: indicates high/low readings
- **GPS (n HiLo)**: indicates GPS mode is selected but HiLo is used because the GPS signal is unavailable. The lowercase n represents the number of satellites in view.

Data Logger Overview

Unless specified differently during setup, data logger files save in the *DvmData* folder by default. To access the folder, double-tap **My Computer** > **C_Drive** > **BTS** > **DvmData**. The data logger file includes the following information (Figure 2-3):

- log file date and time stamp
- reading mode (on/off or single reading)
- readings with date and time stamp
- update interval and voltage range

  If AI-DVM is setup in *GPS Sync* mode, GPS status is included in the log file. Readings include a lower case *g* next to the time stamp to indicate GPS time.

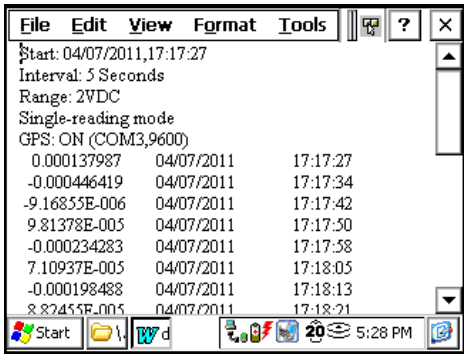


Figure 2-3. Data Logger File

To set up the data logger for use, refer to the *Quick Start* topic on page 26 entitled *Set data logger properties*.

Shortcut Keys

Shortcut keys are an alternate method for using certain commands in AI-DVM instead of menu commands. Use the Allegro keypad to run any of the commands identified in the following table (Table 2-1).

Table 2-1. AI-DVM Shortcut Keys

Command	Shortcut Keys	Description
AiDVM Graph	<**G**> *or* <**ALT**><**G**>	Displays AiDvm graph.
Copy / Paste	<**CTRL**><**C**>	Copies a reading from the digital voltmeter to paste into an PTab spreadsheet file.
Option Window	<**N**> *or* <**ALT**><**N**>	Displays the Options window.
Voltage Range	<**CTRL**><**Up**> <**CTRL**><**Down**> <**Alt**><**U**> *or* <**U**>	Adjust the voltage range or select auto ranging. To increase, select <CTRL><Up>; to decrease <CTRL><Down>; and to auto range select <ALT><U>.
VDC Test Function	<**D**> *or* <**ALT**><**D**>	Selects the Vdc test function.
VAC Test Function	<**A**> *or* <**ALT**><**A**>	Selects the Vac test function.
Amp Test Function	<**M**> *or* <**ALT**><**M**>	Selects the Amp test function.
Ohm Test Function	<**O**> *or* <**ALT**><**I**>	Selects the Ohm test function.
Diode Test Function	<**D**> *or* <**ALT**><**D**>	Selects the Diode test function.
Enable/Disable Autoranging	<**A**>	Press A to move cursor to the *Auto-range enable* field and either enable or disable the option.
Move Cursor to Sample Rate Field	<**S**>	Press S to move cursor to the *Sample rate* field.

Table 2-1. AI-DVM Shortcut Keys

Command	Shortcut Keys	Description
Navigate DVM *Options* Window		The following are available for use in all tabs of DVM *Options*:
	<**Tab**>	• Press <Tab> to move cursor from one field to another.
	<**Up/Down Arrows**> <**Enter**>	• Press <Up/Down Arrows> to move cursor in a drop-down list. Press <Enter> to accept a selection in a drop-down list.
	<**Ok**> / <**Cancel**>	• Move cursor to <Ok> and then press <Enter> to apply changes. Move cursor to <Cancel> and then press <Enter> to cancel changes.
Open Graph Remarks Window and Add Data	<**Tab**> <**Save**> <**Enter**>	• Press <Tab> to move cursor to <Save> button and then press <Enter> to open graph remarks window. • Press <Enter> in graph remarks window to add a new line. • To save remark, press <Tab> to move cursor to <Ok> button and then press <Enter>. • To cancel remark, press <Tab> to move cursor to <Cancel> button and then press <Enter>.

Notes

3 Close Interval Survey (CeCi)

CeCi records pipeline potential readings for close interval (CI) surveys. The software collects survey readings from a data cane or wire counter connected to the Allegro. CeCi measures voltage using the digital voltmeter card inside the Allegro.

This chapter explains how to set up and use AI's close interval software, CeCi. Topics include:

- Quick Start (page 34)
- Set Survey File Options (page 39)
- Add Remarks and Test Point Information (page 41)
- View Survey Records and Show Bearing to Site (page 42)
- Export a Survey File (page 42)
- Transfer a Survey File to PCS (page 43)
- Shortcut Keys (page 45)

Quick Start

Procedures in this section explain how to set up CeCi to record pipeline potential readings for a close interval survey. As a user you will perform the following actions:

- Connect test leads to the Allegro (page 34)
- Set survey properties (page 35)
- Set survey type and mode (page 35)
- Set on/off survey type (page 37)
- Set GPS properties (page 38)
- Save survey file (page 38)
- Record inspection readings (page 38)

Connect test leads to the Allegro

CeCi software records potential readings using the Allegro digital voltmeter and either a data cane or wire counter connected to the red and black jacks on the Allegro connector panel.

To get started, complete the following steps:

1. Plug test leads in the red positive (+) and black negative (–) jacks on the Allegro connector panel; positive to positive, negative to negative (Figure 3-1).
2. Click the **CeCi** icon on the Allegro desktop to display the main CeCi window (Figure 3-1).

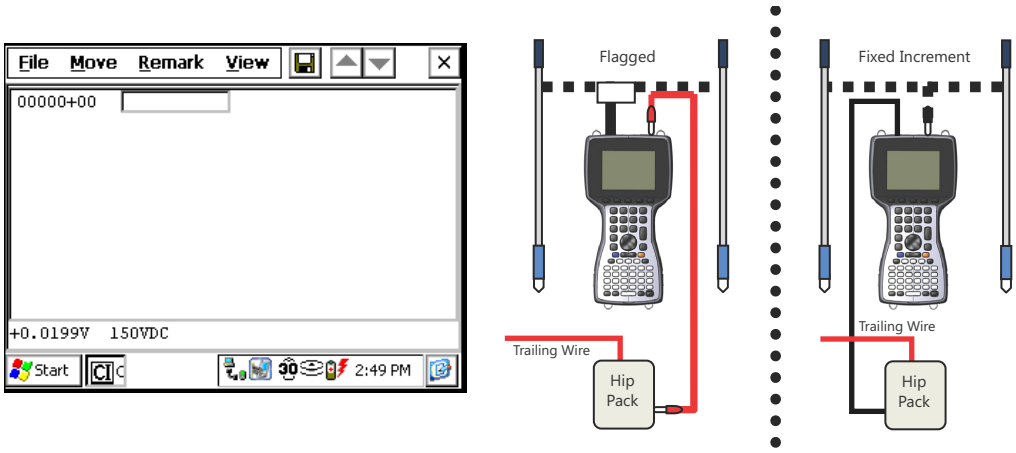


Figure 3-1. CeCi Main Window

Set survey properties

1 Tap **File** > **Properties** to display the *Survey* tab.

2 Provide information in the following fields of the *Survey* tab:

- **Segment**: Enter the name of the ROW (right-of-way) in this required field. If you plan to transfer the survey file to PCS, *Segment* name must match *ROW Code* in PCS. If these fields do not match, PCS creates a new ROW Code and folder labeled *Unknown* in the PCS hierarchy.

- **Pipe:** Enter a pipeline code in this optional field. If you plan to transfer the survey file to PCS, *Pipe* is equivalent to *Pipeline Code* in PCS. If the *ROW Code* entered earlier includes multiple, parallel pipelines with different pipeline codes, enter the appropriate pipeline code. If pipeline codes have not been created in PCS, leave this field empty.

- **Tech:** Enter the surveyor's name in this optional field. If you plan to transfer the survey file to PCS, the surveyor's name populates the *Surveyor* field in the Indirect Survey Manager (ISM) module.

- **Run:** Enter a unique survey name in this optional field. If transferring the survey file to PCS, data in this field creates a new CI survey folder in ISM. Examples of a unique survey name are: station number, milepost number, date, or a combination of date and station or milepost number.

- **Date:** Enter a date or use the one automatically entered by CeCi.

Set survey type and mode

1 Tap the **Type** tab. Click the drop-down arrow in the *Survey Type* field and select either **AC Survey** or **DC Survey**.

Once you begin the survey, *Survey Type* cannot be changed.

2 Tap the **Modes** tab. Click the drop-down arrow in the *Mode* field and select either **Flagged** or **Fixed increment**.

3 Depending on the survey mode selected earlier, continue with the next procedure or *Set fixed increment mode properties* (page 36).

Set flagged mode properties

1 If using a metric data cane to trigger reads, tap **Metric** to record readings in meters.

2 Enter the distance between flags or station markers in the *Flag distance* field.

3 Tap the drop-down arrow in the *Direction* field and select **Ascending** or **Descending** to indicate how station numbers increment in the survey file.

4 If you want to take timed readings using a data cane, tap **Enable Timed Readings** and then enter the number of reads per minute in the *Readings/minute* field.

NOTE: Double-click detection must also be enabled in the *Misc* tab of *Options* (*View* > *Options* > *Misc* tab). Double-clicking the data cane marks a survey record with an *F* flag; triple-clicking will pause or resume timed readings. Pressing *F5* or <Ctrl>+<P> on the Allegro keypad will also pause or resume timed readings.

---

5 If you want to monitor the number of reads per flag, tap **Monitor record count per flag** and then click the drop-down arrow in the **Warn at above average** field and select a percentage value. The Allegro beeps 3 times as a warning when the number of reads for the current flag session is more than the average percentage of reads taken for previous flag sessions.

6 Continue with *Set on/off survey type* (page 37).

Set fixed increment mode properties

1 If using a metric wire counter (chainer) to trigger reads, tap **Metric** to record readings in meters.

2 Enter the distance between reads in the *Increment* field. The distance should be in increments of 2.5 feet or 1 meter for metric mode.

3 Tap the drop-down arrow in the *Direction* field and select **Ascending** or **Descending** to indicate how station numbers increment in the survey file.

4 Tap **Use wire counter** if survey readings will be taken using a wire counter (chainer).

Set on/off survey type

1. Tap the **On/Off** tab.

2. If you are taking an uninterrupted survey, tap the drop-down arrow in the *Survey Type* field and select **On (single reading**). An interrupted survey includes an *on*, *native*, *static*, or *depolarized* survey.

3. If you are taking an interrupted survey using non-GPS synchronized interrupters, complete the following steps:

   a Tap the drop-down arrow in the *Survey Type* field and select **On/Off High/Low**.

   b Enter the same on/off times as set up for the current interrupter in the *ON time* and *OFF time* fields.

   c Enter an *on* delay time in the **On Delay** field and an *off* delay time in the **Off Delay** field.

   On Delay is the time after the *off-to-on* transition when a reading is not recorded. *Off Delay* is the time after the *on-to-off* transition when a reading is not recorded. If a reading is recorded during these transition times, the last available reading before the transition is recorded.

4. If you are taking an interrupted survey using GPS synchronized current interrupters, complete the following steps:

   a Tap the drop-down arrow in the *Survey Type* field and select **On/Off GPS Sync** or **On/off GPS Real-time**.

   On/Off GPS Sync works best for short cycle surveys when the *on* and *off* interval is 1 second or less. *On/Off GPS Real-time* works best for long cycle surveys when either the *on* or *off* cycle is greater than 1 second. For suggested on/off settings, see Appendix A (page 75).

   b Enter the same on/off times as set up for the current interrupter in the fields labeled **ON time**, **OFF time**, and **Cycle begins with**.

   c For an *On/Off GPS Sync* survey, enter a setup time in the **On Setup** field and an off delay time in the **Off Delay** field.

   On Setup is the time before the *off-to-on* transition when a reading is not recorded. *Off Delay* it the time after the *on-to off* transition when a reading is not recorded. If a reading is recorded during these transition times. the last available reading before the transition is recorded.

d For an *On/off GPS Real-time* survey, enter an *on* delay time in the **On Delay** field, an *off* delay time in the **Off Delay** field, and a setup time in the **GPS-RT Setup Time** field.

- *On Delay* is the time after the *off-to-on* transition when a reading is not recorded.
- *Off Delay* is the time after the *on-to-off* transition when a reading is not recorded.
- *GPS-RT Setup Time* is the time before the transition when a reading is not recorded.

  If a reading is recorded during these transition times, the last available reading before the transition is recorded.

Set GPS properties

1. If you are taking an *On/Off GPS Sync* or *On/off GPS Real-time* survey, tap the **GPS** tab to set up GPS properties.
2. Tap **Record GPS Location** to include coordinates with survey readings. Tap the drop-down arrow in the **Record GPS Location** field and select an interval option that identifies how often coordinates are included with readings.
3. Tap **Record time of reading** to include a GPS time stamp with readings.
4. If you are using a second GPS receiver (dual GPS), complete the following steps:

   a Tap the drop-down arrow in the **Comm port** field and select the COM port the GPS receiver is connected to.

   b Tap the drop-down arrow in the **Baudrate** field and select a baud rate supported by the GPS receiver.

   c If you want the Allegro to synchronize with current interrupters using the satellite PPS signal (pulse-per-signal), tap **Read PPS from Internal GPS**.
5. Tap **Ok** to save changes and return to the survey file.

Save survey file

Tap the **Save** icon or tap **File** > **Save**. The *Save As* window displays when working with a new survey file that has not previously been saved. Enter a name for the new survey file in the **Name** field and then tap **OK**.

Record inspection readings

If using a data cane, press **Enter** on the Allegro keypad or single-click the data cane to record readings in the survey file. If using a wire counter (chainer), each pulse from the wire counter automatically records a reading in the survey file.

Set Survey File Options

To set optional features in CeCi, tap **View** > **Options**. Topics in this section include those in the following list:

- Set audio and double-click properties (page 39)
- Set autosave and skip mode properties (page 39)
- Set GPS properties (page 40)
- Set color properties (page 40)
- Set graph properties (page 40)

Set audio and double-click properties

1. Tap the Misc tab and select **Beep on every Reading** if you want the Allegro to beep each time a reading is taken.
2. If you want the Allegro to beep when the voltage is more positive than the warning value you specify, tap **Beep for voltages less negative than this value**, and enter a warning value in the **Voltage level** field.
3. Tap **Beep when overwrite existing data** if you want the Allegro to beep when a survey reading is overwritten.
4. If you want to double-click the data cane to mark a record with a flag in CeCi, tap **Enable double-click detection**.
5. Tap **Ok** to save changes and return to the survey file.

Set autosave and skip mode properties

1. Tap the **File** tab and select **Enable Autosave**.
2. Enter a time interval in the **Interval (minutes)** field to have CeCi automatically save a survey file at regular time intervals.
3. Tap **Retain Skipped records in Skip mode** if you want CeCi to keep the reading for the current record when skipping to another record during *Skip* mode.
4. Tap **Ok** to save changes and return to the survey file.

Set GPS properties

1. Tap the **GPS** tab.
2. If you want CeCi to remove existing GPS coordinates when updated coordinates are unavailable after a specified amount of time, tap **Clear GPS location after** and enter the number of seconds in the **seconds without updates** field.

   When GPS coordinates are older than 30 seconds, CeCi displays the time since the last GPS update. When GPS coordinates are older than 15 seconds, CeCi inserts an asterisk (*) after the coordinates.
3. Tap the drop-down arrow in *GPS display Format* and select either **Degrees and Decimal minutes** or **Decimal degrees**.
4. Tap **Ok** to save changes and return to the survey file.

Set color properties

1. Tap the **Colors** tab and select **Enable color**.
2. Select an option in the list and then a color in the color grid. Repeat this step for each item in the list you want to assign a color.

   For example, to have readings display in red text in the survey file when readings do not meet criteria, select **Invalid Value** and the color **red** in the color grid.
3. Tap **Ok** to save changes and return to the survey file.

Set graph properties

1. Tap the **Graph** tab and select **Show Graph**.
2. Set upper voltage by entering a value in the **Upper value** field or tapping the up/down arrows.
3. Set lower voltage by entering a value in the **Lower value** field or tapping the up/down arrows.
4. Indicate how much data to display by entering a value (in feet) in the **Width** field or tapping the up/down arrows.
5. Tap **OK** to close the window and return to the survey file.
6. Tap the save icon.

   Double-tapping inside the graph displays the *Graph* tab, as well as tapping *View* > *Options* > *Graph* tab.
7. Tap **Ok** to save changes and return to the survey file.

Add Remarks and Test Point Information

The *Remarks* and *Test Point Information* windows allow you to add additional information in the remarks field of a survey record. For example, add a geographical reference or the type of test point.

Add a remark

1. Select a survey record and then tap **Remark** in the main menu.
2. Double-tap a remark or enter the remark's code number. CeCi inserts the remark in the remarks field of the currently selected record. You can also enter your own remark in the remarks field.

Add test point information

1. Select a survey record and then tap **View** > **Test Point Info**.
2. Double-tap a test point and enter required values when prompted.
3. Tap **OK** to enter the information in the survey record and return to the survey file.

View Survey Records and Show Bearing to Site

You can view survey records either as a list or single record. Tap **View** > **Single record** or **List**.

When viewing a single record with GPS coordinates, double-tap the GPS field to display the *Site Locator* window. Tapping **View** > **Show bearing to site** also displays the window (Figure 3-2).

The *Site Locator* window shows bearing and distance to a target location. Bearing is blank when the Allegro is not receiving a valid GPS fix. The message *Out of Range* displays when the following conditions occur:

- The difference in latitude and longitude is more than 5 degrees.
- Latitude is above 85 degrees north or below 85 degrees south. Also expressed as 85-90N degrees latitude (northern hemisphere) and 85-90S degrees latitude (southern hemisphere).

Figure 3-2. Site Locator

Export a Survey File

You can export CeCi survey files as a dBase file (.dbf) or comma separated file (.csv) for use with other software applications, such as Microsoft Excel.

To export a survey file, follow these steps:

1. Tap **File** > **Export**.
2. Tap the **Type** field and select an export format from the list of options.
3. Tap **OK** to close the window.
4. Use Windows Mobile Device Center or ActiveSync to move a copy from the Allegro *CiData* folder to your computer (*Start* > *File Explorer* > *Storage (or SD Card)* > *AI* > *CiData*).

Transfer a Survey File to PCS

PCS utility files labeled *wToCmd.exe* and *CeFileXer.exe* must be updated for the current release of Allegro software in order for survey files to transfer properly from the Allegro to PCS. For more information, refer to *Transfer Utility Files to PCS* (page 9).

To transfer a CeCi survey file to PCS:

1. Connect the provided serial cable to your computer and the Allegro. If you are using a USB power dock, connect the USB cable to the power dock and your computer.

2. At your computer, start WMDC or ActiveSync. Follow on-screen prompts to establish communications. For ActiveSync users, click **No** when prompted to create a *Partnership*. Clicking *No* allows you to create a *Guest* connection instead.

3. Start PCS and click **Module** > **Indirect Survey Manager (ISM)**.

4. Click **Field Computer** > **Receive Data**.

5. Click **Receive CIS Data** and **From Allegro**

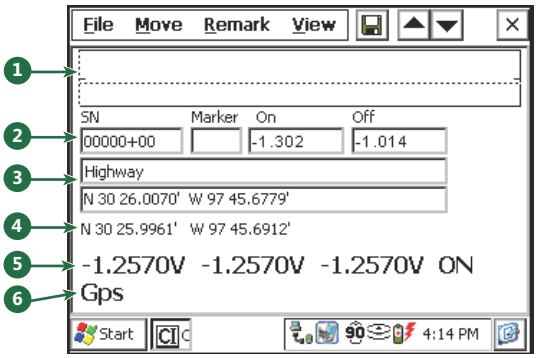
6. Click **Retrieve File Listing** and select the survey files you want to transfer.

7. Click **Receive** and then click **OK** when the message *Processing file completed* displays. Refer to the PCS manual for information about viewing and managing survey data in ISM.

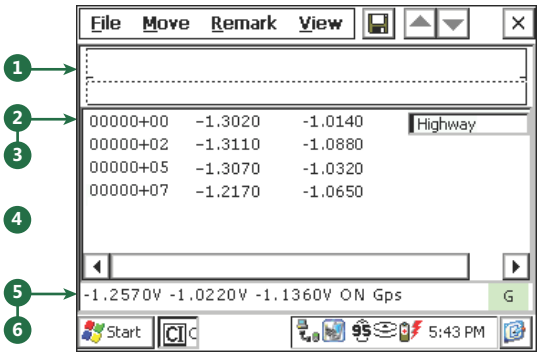
Survey File Features

The following example (Figure 3-3) shows the type of information that displays in a survey file.

Single Record View
(View > Single record)



List View
(View > List)



1. Graph of survey readings (View > Options > Graph tab).
2. Station number (SN); Marker field that may be blank or contain any of the following markers based on the survey setup: *F* (flag), *G* (gap), or *M* (location entered manually); and On/Off readings.
3. Survey remarks field. If the location includes recorded GPS coordinates and you view the survey file in *Single record* mode, coordinates display in the survey remarks field.
4. Current GPS coordinates. If satellite communication has not been established, *GPS invalid* displays. When viewing in *List View* mode, coordinates record in the survey file but do not display.
5. On, off, and live DVM reading. *ON* or *OFF* display based on the current cycle position.
6. *GPS* displays when using GPS and satellite communication has been established. If the Allegro loses the GPS signal, *GPS (Hilo)* displays.

   Any of the following status indicators also display when viewing in *List View* mode:

   - *(1)*, *(2)*, or *(3)*: number of satellites in view.
   - *G*: receiving GPS locations from 4 or more satellites.
   - *D*: receiving differential GPS locations.
   - – – –: receiving invalid GPS data.
   - (blank): GPS is unavailable or not currently in use.

Figure 3-3. CeCi Survey File Features

Shortcut Keys

Shortcut keys listed in the following table (Table 3-1) are an alternate method for using certain commands in CeCi. Use the Allegro keypad to run any of the following commands.

Table 3-1. CeCi Shortcut Keys

Command	Shortcut Keys	Description
New	<**Ctrl**><**N**>	Opens a new survey.
Open	<**Ctrl**><**O**>	Displays the File Open window.
Save	<**Ctrl**><**S**>	Saves the survey.
Flag Marker	<**F**>	Inserts a flag marker.
Reset Flag Count	<**Ctrl**><**F**>	Reset Flag Count
Gap Marker	<**G**>	Inserts a gap marker in Flagged mode.
Capture Reading	<**Enter**>	Captures a reading.
Go to first record	<**CTRL**><**Home**>	Moves the cursor to the first record
Go to last record	<**CTRL**><**End**>	Moves the cursor to the last record
Go To...	<**Ctrl**><**G**>	Displays the Go To Location window.
Skip	<**Ctrl**><**K**>	Displays the Skip Distance window (only in Fixed Increment).
Insert Record	<**CTRL**><**Ins**>	Inserts a new record.
Delete Record	<**CTRL**><**Del**>	Deletes a record.

Table 3-1. CeCi Shortcut Keys (continued)

Command	Shortcut Keys	Description
Skip/Lock/Normal	<**F3**>	Toggles between Skip/Lock/ Normal in Fixed Increment mode.
Pause	<**F5**>	Pauses timed readings.
Test Point Information	<**Ctrl**><**T**>	Displays the Test Point Information window.
Open *File* Menu	<**Alt**><**F**>	Opens *File* menu.
Open *Move* Menu	<**Alt**><**M**>	Opens *Move* menu.
Open *Remark* Window	<**Ctrl**><**R**>	Opens Remark window.
Ok / Cancel	<**Ok**> / **<Cancel>**	Press <Ok> to apply changes or <Cancel> to cancel changes.
Navigate *Open* and *Save As* Windows	<**Tab**>	Press <**Tab**> to move cursor between fields.
	<**Up/Down Arrows**> and <**Home/End Arrows**>	Press <**Up/Down** and **Home/ End Arrows**> to navigate list of files.
Navigate *GPS* Tab		Performs the following functions in the GPS tab of Options:
	<**C**>	• Press <**C**> to enable or disable *Clear GPS Location After*.
	<**S**>	• Press <**S**> to move cursor to *Seconds Without Updates*.
	<**G**>	• Press <**G**> to move cursor to *GPS Display Format*.

Table 3-1. CeCi Shortcut Keys (continued)

Command	Shortcut Keys	Description
Navigate *Graph* Tab	<**G**>	Press <**G**> to enable or disable *Show Graph* in *Graph* tab of *Options*. With *Show Graph* enabled:
	<**U**>	• Press <**U**> to move cursor to *Upper Value*.
	<**L**>	• Press <**L**> to move cursor to *Lower Value*.
	<**W**>	• Press <**W**> to move cursor to *Width*.
Navigate Colors Tab	<**E**>	Press <**E**> to enable or disable *Enable Color* in the *Colors* tab of *Options*. With *Enable Color* enabled:
	<**Tab**>	• Press <**Tab**> to move cursor between field selection list and color grid.
	<**Up/Down Arrows**>	• Press <**Up/Down Arrows**> to navigate field selection list.
	<**Home/End Arrows**>	• Press <**Up/Down Arrows**> or <**Home/End Arrows**> to navigate color grid.

Notes

4 DC Voltage Gradient (DCVG)

DCVG locates indications of pipeline coating defects. The software records the voltage gradient and GPS location for further review and analysis later. DCVG collects data from a data cane connected to the Allegro.

This chapter explains how to set up and use AI's DCVG software. Topics include those in the following list:

- Quick Start (page 49)
- Survey File Options (page 54)
- Add Remarks, Indication, and Test Point Information (page 56)
- View Survey Records and Show Bearing to Site (page 57)
- Export a Survey File (page 58)
- Shortcut Keys (page 60)

Quick Start

Procedures in this section explain how to set up the DCVG software to measure and record direct current voltage gradients for a DCVG survey. As a user you will perform the following actions:

- Connect data canes to the Allegro (page 50)
- Set survey properties (page 51)
- Set survey mode (page 51)

- Set on/off survey type (page 52)
- Set DCVG properties (page 53)
- Set GPS properties (page 53)
- Save survey file (page 54)
- Record inspection readings (page 54)

Connect data canes to the Allegro

DCVG collects data using two data canes connected to the red and black jacks on the Allegro connector panel. When an indication is detected, you can then define the size of the indication.

Complete the following steps:

1. Plug data canes in the red positive (+) and black negative (–) jacks on the Allegro connector panel; positive to positive, negative to negative (Figure 4-1).

2. Click the **DCVG** icon on the Allegro desktop to display the main DCVG window (Figure 4-1).

   The reading area at the top of the DCVG window displays the IR gradient (on reading minus the off reading); millivolt reading (shown as 2 mV in the next example); and polarity if enabled in the DCVG tab of Properties. The polarity arrow displays when readings are greater than 3mV or less than –3mV.

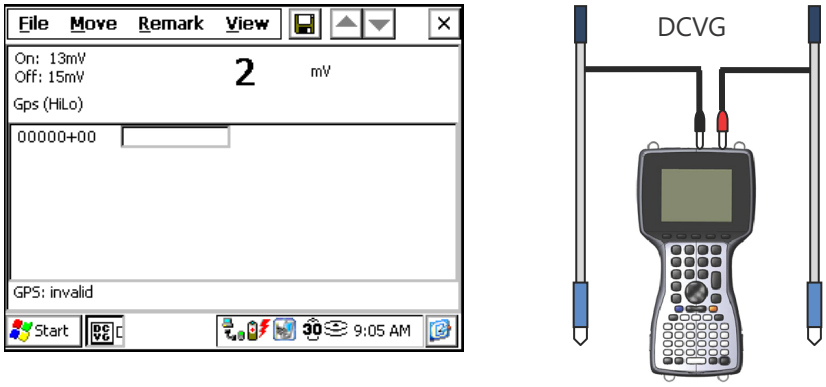


Figure 4-1. DCVG Main Window

Set survey properties

1 Tap **File** > **Properties** to display the *Survey* tab.

2 Provide information in the following fields of the *Survey* tab:

- **Segment**: Enter the name of the ROW (right-of-way) in this required field. If you plan to import DCVG data in PCS using Bridge, *Segment* name must match *ROW Code* in PCS. If these fields do not match, PCS creates a new ROW Code and folder labeled *Unknown* in the PCS hierarchy.

NOTE: PCS does not currently support direct import of Allegro DCVG survey files (*Field Computer* > *Receive Data*). If your PCS activation code includes Bridge, you can however import DCVG data using PCS Bridge (*Tools* > *Bridge*). See the PCS user manual for details.

- **Pipe:** Enter a pipeline code in this optional field. If you plan to import DCVG data in PCS using Bridge, *Pipe* is equivalent to *Pipeline Code* in PCS. If the *ROW Code* entered earlier includes multiple, parallel pipelines with different pipeline codes, enter the appropriate pipeline code. If pipeline codes have not been created in PCS, leave this field empty.

- **Tech:** Enter the surveyor's name in this optional field. If you plan to import DCVG data in PCS using Bridge, the surveyor's name populates the *Surveyor* field in the Indirect Survey Manager (ISM) module.

- **Run:** Enter a unique survey name in this optional field. For example, include station number, milepost number, date, or a combination of station number and date, or milepost and station number. If you plan to import DCVG data in PCS using Bridge, data in this field creates a new CI survey folder in ISM.

- **Date:** Enter a date or use the one automatically entered by DCVG.

Set survey mode

1 Tap the **Modes** tab. Click the drop-down arrow in the *Mode* field and select either **Flagged** or **Fixed increment**.

2 Depending on the survey mode selected earlier, continue with the next procedure or *Set fixed increment mode properties* (page 52).

Set flagged mode properties

1 Tap **Metric** if you want readings recorded in meters instead of feet.

2 Enter the distance between flags or station markers in the *Flag distance* field.

3 Click the drop-down arrow in the *Direction* field and select **Ascending** or **Descending** to indicate how station numbers increment in the survey file.

4 If you want to monitor the number of reads per flag, tap **Monitor record count per flag** and then click the drop-down arrow in the **Warn at above average** field and select a percentage value. The Allegro beeps 3 times as a warning when the number of reads for the current flag session is more than the average percentage of reads taken for previous flag sessions.

5 Skip the next section and continue with *Set on/off survey type* (page 52).

Set fixed increment mode properties

1 Tap **Metric** if you want readings recorded in meters instead of feet.

2 Enter the distance between reads in the *Increment* field.

3 Click the drop-down arrow in the *Direction* field and select **Ascending** or **Descending** to indicate how station numbers increment in the survey file.

Set on/off survey type

1 Tap the **On/Off** tab.

2 Tap the drop-down arrow in the **Survey Type** field and select one of the following survey types:

- **On/Off High/Low**: Select this survey type for interrupted surveys using non-GPS synchronized interrupters. Enter the same on/off times as set up for the current interrupter in the *ON time*, *OFF time*, *On Delay*, and *Off Delay* fields.

- **On/Off GPS Sync**: Select this survey type for an interrupted survey using GPS synchronized current interrupters. Enter the same on/off times as set up for the current interrupter in the *ON time*, *OFF time*, *On Setup*, *Off Delay*, and *Cycle begins with* fields. This survey type requires that you also set up properties in the *GPS* tab.

Set DCVG properties

1. Tap the **DCVG** tab.
2. Measure and enter the *on* reading taken at the beginning and end of the survey in the *P/S On*, *Begin* and *End* fields.
3. Measure the *Off* reading taken at the beginning and end of the survey in the *P/S Off*, *Begin,* and *End* fields. Tap the **V** button to view a live voltage reading and then press **Enter** on the Allegro keyboard to save the voltage reading.
4. Take readings at the beginning and end of the survey. Enter the difference in the *Half-cell calibration Begin* and *End* fields. Tap the **V** button to view a live voltage reading for either of these fields.
5. Tap **Show DCVG Polarity** if you want a directional arrow to display in the main DCVG window indicating the polarity of the reading during the survey.

Set GPS properties

1. Tap the **GPS** tab.
2. Tap **Record GPS Location** to include coordinates with survey readings. Tap the drop-down arrow in the **Record GPS Location** field and select an interval option that identifies how often coordinates are included with readings.
3. Tap **Record time of reading** to include a GPS time stamp with readings.
4. If you are using a second GPS receiver (dual GPS), complete the following steps:
   - **a** Tap the drop-down arrow in the **Comm port** field and select the COM port the GPS receiver is connected to.
   - **b** Tap the drop-down arrow in the **Baudrate** field and select a baud rate supported by the GPS receiver.
   - **c** Tap **Read PPS from Internal GPS** if you want the Allegro internal GPS receiver to provide a time stamp for readings.
5. Tap **OK** to close *Survey* properties.

Save survey file

Tap the save icon or **File** > **Save**. The *Save As* window displays when working with a new survey file that has not previously been saved. Enter a name for the new survey file in the **Name** field and then tap **OK**.

Record inspection readings

Press **Enter** on the Allegro keypad or single-click the data cane to record readings in the survey file.

Survey File Options

To set optional features in DCVG, tap **View** > **Options**. Topics in this section include those in the following list:

- Set optional audio and double-click properties (page 54)
- Set optional autosave properties (page 55)
- Set optional GPS properties (page 55)
- Set optional color properties (page 55)

Set optional audio and double-click properties

1. Tap the **Misc** tab if it is not visible (*View* > *Options* > *Misc* tab).
2. If you want the Allegro to beep when the voltage is above an absolute value you specify, tap **Beep for voltages above this absolute value**, and enter a warning value in the **Voltage level** field.
3. Tap **Beep when overwrite existing data** if you want the Allegro to beep when a survey reading is overwritten.
4. If you want to double-click the data cane to mark a survey record with a flag, tap **Enable double-click detection**.

Set optional autosave properties

1. Tap the **File** tab (*View* > *Options* > *File* tab).
2. Tap **Enable Autosave**.
3. Enter a time interval in the **Interval (minutes)** field. This allows DCVG to automatically save a survey file at regular time intervals based on the *Interval (minutes)* you specify.

Set optional GPS properties

1. Tap the **GPS** tab (*View* > *Options* > *GPS* tab).
2. If you want DCVG to remove existing GPS coordinates when updated coordinates are unavailable after a specified amount of time, tap **Clear GPS location after** and enter the number of seconds in the **seconds without updates** field.

   When GPS coordinates are older than 30 seconds, DCVG displays the time since the last GPS update. When GPS coordinates are older than 15 seconds, DCVG inserts an asterisk (*) after the coordinates.
3. Tap the drop-down arrow in *GPS display Format* and select either **Degrees and Decimal minutes** or **Decimal degrees**.

Set optional color properties

1. Tap the **Colors** tab (*View* > *Options* > *Colors* tab).
2. Tap **Enable color**.
3. Select an option in the list and then a color in the color grid. Repeat this step for each item in the list you want to assign a color. For example, to have readings that do not meet criteria display in red text, select *Invalid Value* and the color *red* in the color grid.

Add Remarks, Indication, and Test Point Information

The *Remarks* and *Test Point Information* windows allow you to add additional information in the remarks field of a survey record. For example, add information for an indication in *Test Point Info* or additional geographical references in *Remarks*.

Topics in this section explain how to:

- Add a remark (page 56)
- Add indication information (page 56)
- Add test point information (page 57)

Add a remark

1. Select a survey record and then tap **Remark** in the main menu.
2. Double-tap a remark or enter the remark's code number. DCVG inserts the remark in the remarks field of the currently selected record. You can also enter your own remark in the remarks field of the survey file.

Add indication information

1. Tap **View** > **Test Point Info** when an indication is found during the survey.
2. Double-tap **Indication** to display an indication sizing window.
3. Enter information about the indication in the following fields of the *Summary* tab:

   a **ID:** Enter an identification number for the indication.

   b **Type:** Tap the drop-arrow in the *Type* field and select the type of indication. Options include *Unknown*, *Cathodic/Anodic*, *Anodic/Cathodic*, *Anodic/Anodic*, and *Cathodic/Cathodic*.

   c **Signal Strength:** Enter the signal strength of the indication. DCVG automatically calculates and enters values in the *Total IR* and *% IR* fields.

   Signal strength is the pipe-to-soil *On* reading minus the pipe-to-soil *Off* reading (P/S On – P/S Off).

4 Tap the **IRGradient** tab and complete the following steps:

   a Take readings at the indication site until you reach remote earth. Press the data cane button to capture readings in DCVG, or press **Enter** on the Allegro keypad. DCVG automatically calculates *Total IR*.

   b Tap **OK** to return to the survey file.

Add test point information

1 Select a survey record and then tap **View** > **Test Point Info**.

2 Double-tap a test point and enter required values when prompted.

3 Tap **OK** to enter the information in the survey record and return to the survey file.

View Survey Records and Show Bearing to Site

You can view survey records either as a list or single record. Tap **View** > **Single record** or **List**.

When viewing a single record with GPS coordinates, double-tap the GPS field to display the *Site Locator* window. Tapping **View** > **Show bearing to site** also displays the window (Figure 4-2).

The *Site Locator* window shows bearing and distance to a target location. Bearing is blank when the Allegro is not receiving a valid GPS fix. The message *Out of Range* displays when the following conditions occur:

- The difference in latitude and longitude is more than 5 degrees.
- Latitude is above 85 degrees north or below 85 degrees south. Also expressed as 85-90N degrees latitude (northern hemisphere) and 85-90S degrees latitude (southern hemisphere).

Figure 4-2. Site Locator

Export a Survey File

You can export DCVG survey files as a dBase file (.dbf) or comma separated file (.csv) for use with other software applications, such as Microsoft Excel.

To export a survey file, follow these steps:

1. Tap **File** > **Export**.
2. Tap the **Type** field and select an export format from the list of options.
3. Tap **OK** to close the window.
4. Use Windows Mobile Device Center or ActiveSync to move a copy from the Allegro *CiData* folder to your computer (*Start* > *File Explorer* > *Storage (or SD Card)* > *AI* > *CiData*).

Survey File Features

The following example shows the type of information that displays in a DCVG survey file (Figure 4-3).

1. Live on/off reading, IR gradient, and polarity arrow.

   Polarity arrow displays when *Show DCVG Polarity* is enabled (*File* > *Properties* > *DCVG* tab). Positive (+) is indicated with a right pointing arrow, negative (–) is indicated with a left pointing arrow.

2. Status line with any of the following information:
   - Shows recorded data for a selected record, such as indication number, type, signal strength, and remarks.
   - Shows any of the following when capturing data for a survey record:

     Gps: Receiving satellite signal. Survey file is set up in *On/Off GPS Sync* mode.

     Gps (HiLo): Not receiving satellite signal; data is captured in *HiLo* mode instead. Survey file is set up in *On/Off GPS Sync* mode.

     HiLo: Survey file is set up in *On/Off High/Low* mode.

     F:0: Flag marker and flag count. Survey file is set up in *Flagged* mode and option *Monitor record count per flag* is enabled.

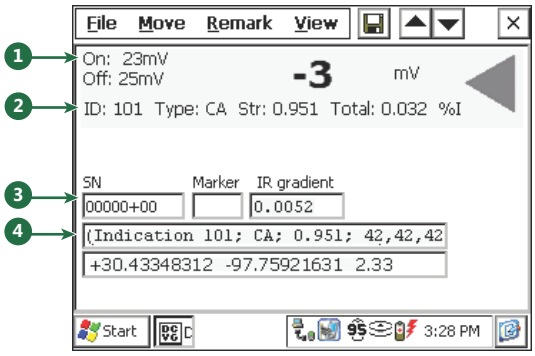
3. Recorded station number (SN), marker, and IR gradient.

   When viewing in *List* mode, also includes Remarks field with indication data (number, type, signal strength, and remarks).

4. Single record mode: Remark field with recorded indication data. Second remark field displays with GPS coordinates when set up in On/Off GPS Sync mode.

5. List Mode: Live GPS coordinates, number of satellites in view, and PDOP signal strength.

Single Record View
(View > Single record)



List View
(View > List)

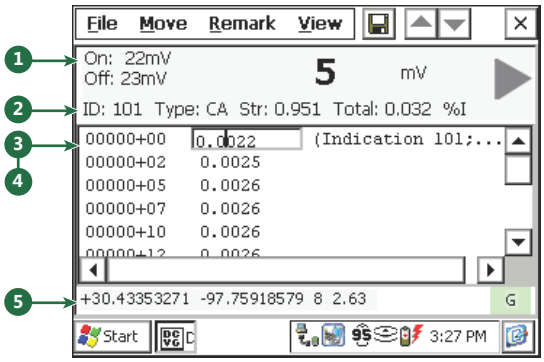


Figure 4-3. DCVG Survey File Features

Shortcut Keys

Shortcut keys listed in the next table (Table 4-1) are an alternate method for using certain commands in DCVG. Use the Allegro keypad to run any of the following commands.

Table 4-1. DCVG Shortcut Keys

Command	Shortcut Keys	Description
New	<**Ctrl**><**N**>	Creates a new survey.
Open	<**Ctrl**><**O**>	Displays the File Open window.
Save	<**Ctrl**><**S**>	Saves the survey.
Flag Marker	<**F**>	Enters an F in the record to show a Flag.
Gap	<**G**>	Enters a G in the record to show a Gap.
Capture Reading	<**Enter**>	Captures a reading.
Go to first record	<**CTRL**><**Home**>	Moves the cursor to the first record
Go to last record	<**CTRL**><**End**>	Moves the cursor to the last record
Go To...	<**Ctrl**><**G**>	Displays the Go To location window.
Skip	<**Ctrl**><**K**>	Displays the Skip Distance window (only in Fixed Increment).
Insert Record	<**CTRL**><**Ins**>	Inserts a new record.
Delete Record	<**CTRL**><**Del**>	Deletes a record.
Test Point Information	<**Ctrl**><**T**>	Displays the Test Point Information window.

Notes

5 Annual/Periodic Survey (Periodic Survey)

Periodic Survey (PS) measures voltage readings for annual and periodic surveys. The software collects survey readings from test leads connected to the Allegro. PS is used in conjunction with AI's PCS software. Facility and inspection fields are established in PCS and then transferred to the Allegro. After completing a survey, data is then transferred from the Allegro back to PCS.

NOTE: The PCS survey route includes information and reading fields for ROW (right-of-way) facilities to be surveyed. For information about how to build and transfer a survey route to the Allegro, refer to the PCS user manual.

Topics in this chapter include those in the following list:

- Quick Start (page 64)
- Timed Readings (page 68)
- Set Autosave Properties (page 69)
- Transfer a Survey Route to PCS (page 69)
- Copy a Survey Route to a Computer (page 70)
- Survey Route Features (page 71)
- Shortcut Keys (page 72)

Quick Start

Procedures in this section explain how to set up the Periodic Survey software to record readings for an annual or periodic survey. As a user you will perform the following actions:

- Connect test leads to the Allegro (page 64)
- Set on/off survey method (page 65)
- Set GPS properties (page 65)
- Add or delete a new site (page 66)
- Change font properties (page 67)
- Save survey route (page 68)
- Record inspection readings (page 68)

Connect test leads to the Allegro

PS records facility inspection readings using the Allegro digital voltmeter and a data cane connected to the red and black jacks on the Allegro connector panel.

Complete the following steps:

1. Plug test leads in the red positive (**+**) and black negative (**–**) jacks on the Allegro connector panel; positive to positive, negative to negative.
2. Click the **PS** icon on the Allegro desktop to start the software (Figure 5-1).
3. Tap **File** > **Open**. Select a survey route in the *Open* window and then tap **OK**.

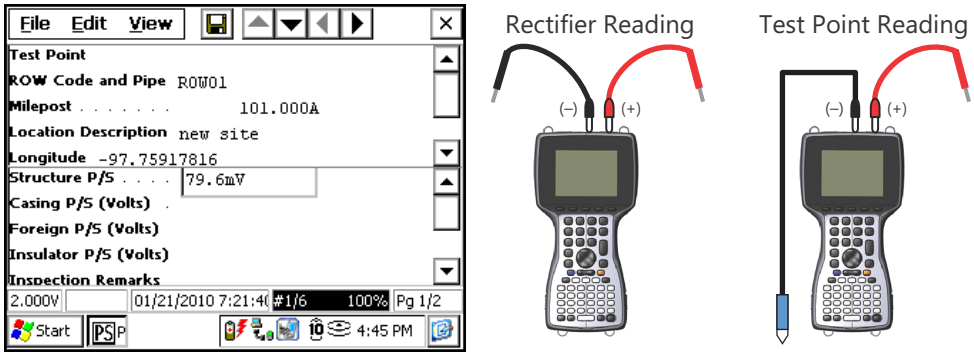


Figure 5-1. PS Survey Route

Set on/off survey method

1. If you plan to take on/off potential readings, tap **View** > **Options** to display the *On/Off* tab.

2. Tap the drop-down arrow in the **On-Off Method** field and select one of the following survey methods:

   - **High/Low**: Select this survey method for an interrupted survey using non-GPS synchronized interrupters. Enter the same on/off times as set up for the current interrupter in the *ON time*, *OFF time*, *On Delay*, and *Instant Off Delay* fields.

   - **GPS Sync**: Select this survey method for an interrupted survey using GPS synchronized current interrupters. Enter the same on/off times as set up for the current interrupter in the *ON time*, *OFF time*, *Instant On Setup*, *Instant Off Delay*, and *Cycle begins with* fields. This survey type requires that you also set up properties in the *GPS* tab (*View* > *Options* > *GPS* tab).

     If on/off time settings are incorrect for either *High/Low* or *GPS Sync*, an error message displays with suggested settings. The error message includes a suggested setting with a calculated minimum value inside parentheses.

     NOTE: The *Disable* option in the *On-Off Method* drop-down list disables the commands *Insert GPS* in the *Edit* menu and *Turn ON* in the *Edit* > *GPS* submenu.

Set GPS properties

1. If you want to include GPS coordinates with readings, tap **Edit** > **GPS** > **Turn ON**.

2. Set GPS *Display Format* and enable *Show Bearing-distance to site* using the following these steps:

   a Tap **View** > **Options** > **GPS** tab.

   b Tap the drop-down arrow in the *Display Format* field and select either **Degrees and Decimal minutes** or **Decimal degrees**. Tap **OK** to close the window.

   c Tap the **Misc** tab and then tap **Show Bearing-distance to site**. Tap **OK** to close the window.

3 If you are using a second GPS receiver (dual GPS), complete the following steps:

   a Tap **Edit** > **GPS** > **Gps Settings** to display the *GPS Port Settings* window.

   b Tap the drop-down arrow in the **Comm port** field and select the COM port the GPS receiver is connected to.

   c Tap the drop-down arrow in the **Baudrate** field and select a baud rate supported by the GPS receiver.

   d Tap **Read PPS from Internal GPS** if you want the Allegro internal GPS receiver to provide a time stamp with readings.

Add or delete a new site

Complete the following steps to add or delete a new site. New sites added on the Allegro are marked with a bullet (•) in the *Site List* and can be deleted.

Complete the following steps:

1 Tap **View** > **Site List**.

2 Tap **Options** and complete the following steps to set up *Site List* display properties:

   a Tap the arrow in *Order site by* and select either **Normal order** or **GPS proximity**.

   b Tap the arrow in *Show* and select either **All sites** or **Only unsurveyed sites**. Tap **OK** to return to *Site List*.

3 To add a new site:

   a Tap **Add new site**.

   b Tap a facility type in the list to select a template for the new site.

   c Tap **OK** to close the window and return to the survey route.

d Click the drop-down arrow in the **ROW Code** field. Select a ROW code or select **Other** and then enter a new ROW code.

If you selected **Other**, complete the following steps to prevent entering an incorrect ROW code:

1) Highlight an existing ROW code by pressing <**Shift**> <**Blue**> <**End**> on the Allegro keypad, and then press <**Ctrl**> <**C**>.

2) Tap the ROW code field of the new site and press <**Ctrl**> <**V**>. Edit the ROW code of the new site as needed.

e Tap **OK** to return to the survey route.

IMPORTANT: If the *ROW Code* field is empty when the survey route is transferred to PCS, a new ROW code is created in the PCS hierarchy labeled *From Allegro*.

---

f Tap the **Milepost** field and enter the new site's milepost number.

g Enter data for the new site in the Information fields. Information and Reading fields are separated with a horizontal line. Information fields are above the line and Readings fields are below the line.

4 To delete a site added on the Allegro:

a Tap **View** > **Site List**.

b Tap a site marked with a bullet (•) and then tap **Delete**.

c Tap **Yes** when the message *Delete this site?* displays.

Change font properties

1 Tap **View** > **Options** > **Fonts**.

2 Click the drop-down arrow in the *Item* field and select **Site List**, **Edit caption**, or **Edit field**.

Site List is a list of templates for adding a new site in the survey route (View > Site List). *Edit caption* refers to field names and *Edit field* refers to data entered in fields.

3 Click the drop-down arrow in the *Font* field and select a font type.

4 Click the drop-down arrow in the *Size* field and select a font size.

5 Repeat steps 2 through 4 to change font properties for another item. When you finish, click **OK** to return to the survey file.

Save survey route

Tap the save icon or tap **File** > **Save** to save changes in the survey route.

Record inspection readings

Select a reading field and then press **Enter** on the Allegro keypad to activate the digital voltmeter. Press **Enter** again or single-click the data cane to capture the reading in the survey file.

Timed Readings

When the survey route is set up in PCS with Allegro prompts for the following fields, these same fields are available in PS for timed readings: *Min P/S*, *Max P/S*, *Average P/S*, and *P/S Sample Time*.

To take timed readings, follow these steps:

1 Select one of the following fields and then press **Enter** on the Allegro keypad: *Min P/S*, *Max P/S*, *Average P/S*, and *P/S Sample Time*.

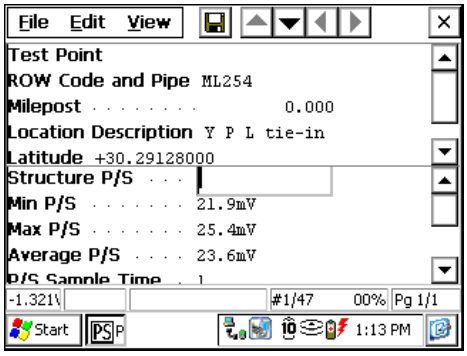


Figure 5-2. Timed Reading Fields

2 When the *Averaged Reading Survey* window displays, tap the arrow in the *Duration* field and select the length of time the Allegro should take timed readings.

3 Tap **Start** to begin timed readings. When timed readings finish, tap **OK** to return to the survey route.

Tapping **Stop** anytime during the cycle stops timed readings.

Set Autosave Properties

PS provides an *Autosave* option that automatically saves the survey route at regular intervals. To set *Autosave* properties, follow these steps:

1. Tap **View** > **Options** > **Misc** tab.
2. Tap **Enable Autosave** and select a time interval in the **Interval (minutes)** field.
3. Tap **OK** to close the window and return to the survey route.

Transfer a Survey Route to PCS

PCS utility files labeled *wToCmd.exe* and *CeFileXer.exe* must be updated for the current release of Allegro software in order for survey files to transfer properly from the Allegro to PCS. For more information, refer to *Transfer Utility Files to PCS* on page 9.

To transfer a PS survey route to PCS, follow these steps:

1. Connect the provided serial cable to your computer and the Allegro. If you are using a USB power dock, connect the USB cable to the power dock and your computer.
2. At your computer, start WMDC or ActiveSync. Follow on-screen prompts to establish communications. For ActiveSync users, click **No** when prompted to create a *Partnership*. Clicking *No* allows you to create a *Guest* connection instead.
3. Start PCS and open any module other than Indirect Survey Manager (ISM). For example, click **Module** > **Cathodic Protection Data Manager (CPDM)**.
4. Click **Field Computer** > **Receive Data** to display the *Receive Allegro Data* window.
5. Click **Receive Facility Data** > **From Allegro** > **Retrieve File Listing**.
6. Select the survey file(s) you want to transfer to PCS and then click **Receive**. When the window *Options for Receiving Data* displays, choose an option to assign a survey to Allegro data and then click **Continue**.
7. Click **OK** when the message *Receive Allegro Data* displays stating the process is complete.

Copy a Survey Route to a Computer

Complete the following steps to copy one or more PS survey routes to a computer:

1. Connect the provided serial cable to your computer and the Allegro. If you are using a USB power dock, connect the USB cable to the power dock and your computer.

2. At your computer, start WMDC or ActiveSync. Follow on-screen prompts to establish communications. For ActiveSync users, click **No** when prompted to create a *Partnership*. Clicking *No* allows you to create a *Guest* connection instead.

3. In WMDC, point the mouse at **File Management** and then click **Browse the contents of your device**.

   In ActiveSync, click the **Explore** icon in the tool bar to display the contents of the Allegro in Windows Explorer.

4. Click **Storage** (or SD Card) and then double-click the **AI** folder.

5. Double-click the **PsData** folder. Click the **Name** column in Windows Explorer to sort files by name.

6. Select and drag the **.dat** and matching **.vls** file to your computer.

NOTE: PS survey routes use two files; one with a *.dat* extension and the other with a *.vls* extension. Both are labeled with the same filename.

Survey Route Features

A PS survey route includes three main areas of information as shown in the next example (Figure 5-3).

1. Information fields (above horizontal line) from Allegro prompts set up in PCS route file.
2. Reading fields (below horizontal line) from Allegro prompts set up in PCS route file.
3. Status bar with information for the currently selected field displaying in the following status panes.
   - **1st status pane**: may be empty or display the last recorded reading if included in the PCS route file.
   - **2nd status pane**: displays GPS, DGPS, HILO, or DVM range and function based on the *On-Off Method* setup in the survey file (*View* > *Options* > *On/Off* tab).
   - **3rd status pane**: displays date and time of previous reading if included in PCS route file or, bearing-distance if set up in the Allegro and PCS route file includes GPS coordinates.
   - **4th status pane**: displays the record number of the currently viewed facility and the total number of facility records in the survey file. Percentage value identifies percentage of readings taken based on the total number of facility records.
   - **5th status pane**: displays the page number of the page you are viewing and the total number of pages in the survey file.

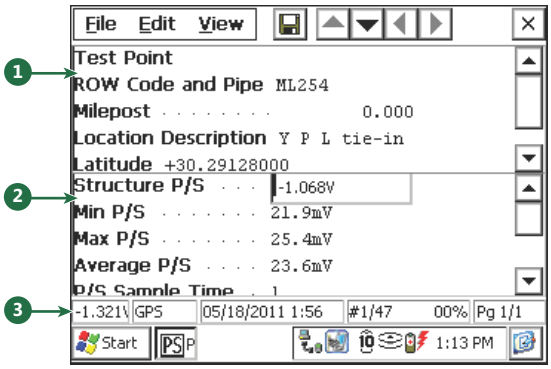


Figure 5-3. Survey Route Features

Shortcut Keys

Shortcut keys listed in the following table (Table 5-1) are an alternate method for using certain commands in PS. Use the Allegro keypad to run any of the following commands.

Table 5-1. PS Shortcut Keys

Command	Shortcut Keys	Description
Record Reading	<**Enter**>	Records a reading. Options include: • Select reading field and press <Enter> to activate the digital voltmeter. Press <Enter> again to record the reading. • Select timed reading field and press <Enter> to set up, start, stop, or cancel timed reading mode.
Record GPS Coordinates	<**F4**>	Records GPS coordinates when cursor is in a reading field.
Insert GPS Coordinates	<**F4**>	Insert GPS coordinates when cursor is in a reading field and GPS status is running in the background.
Select Data in a Field	<**Shift**><**Blue**><**Home**>	Select data from the current cursor location to the end of the field.
	<**Shift**><**Blue**><**End**>	Select data from the current cursor location to the beginning of the field.
Copy, Cut, Paste	<**CTRL**><**C**>	Copy selection to the clipboard.
	<**CTRL**><**X**>	Remove selection and copy to clipboard.
	<**CTRL**><**V**>	Paste data from clipboard.
Undo	<**Ctrl**><**Z**>	Undo last change.
Open	<**Ctrl**> <**O**>	Opens the *File Open* window.

Table 5-1. PS Shortcut Keys (continued)

Command	Shortcut Keys	Description
Save	<**CTRL**> <**S**>	Save survey file.
Next Page	<**Ctrl**> <**Down**>	Display next page of a multi-page site.
Previous Page	<**Ctrl**> <**Up**>	Display previous page of a multi-page site.
Previous Site	<**Shift**> <**Up Arrow**>	Display previous site.
Next Site	<**Shift**> <**Down Arrow**>	Display next site.
Open *File* Menu	<**Alt**> <**F**>	Opens *File* menu.
Open *Edit* Menu	<**Alt**> <**E**>	Opens *Edit* menu.
Open *View* Menu	<**Alt**> <**V**>	Opens *View* menu.
Navigate Information and Reading Fields	<**Alt**> <**U**>	Moves cursor between information and reading fields.
Navigate any Window or Tab	<**Tab**>	• Press <Tab> to move cursor from one field to another.
	<**Up/Down Arrow**>	• Press <Up/Down Arrows> to move cursor in a drop-down list.
	<**Enter**>	• Press <Enter> to accept a selection in a drop-down list.
	<**Ok**> / <**Cancel**>	• Move cursor to <Ok> and then press <Enter> to apply changes. • Move cursor to <Cancel> and then press <Enter> to cancel changes.

Notes

A Recommendations for Interrupted On/Off Settings

This chapter provides recommendations for on/off settings in an interrupted survey set up in AiDvm, CeCi, or Periodic Survey.

When a survey file is set up in *On/Off GPS Sync* or *On/Off GPS Real-time* mode, AI recommends the survey file also be set up with *On/Off High/Low* settings. This serves as a backup if the satellite signal is lost. The Allegro defaults to *On/Off High/Low* survey mode until the satellite signal is re-acquired.

Table A-1. Suggested On/Off Settings

On/Off High/Low setup for 1 second cycle		
A minimum/maximum reading from a sample of readings. Of the remaining 45 readings, the most negative reading is equal to the *on* reading and the most positive reading is equal to the *off* reading.		
60 readings per cycle (60 readings per second):		
0.7 on	200 mSec On Delay	Filters out 12 most negative readings
0.3 off	50 mSec Off Delay	Filters out 3 most positive readings
0.8 on	200 mSec On Delay	Filters out 12 most negative readings
0.2 off	50 mSec Off Delay	Filters out 3 most positive readings

Table A-1. Suggested On/Off Settings (continued)

On/Off High/Low setup for greater than 1 second cycle		
A minimum/maximum reading from a sample of readings. Of the remaining 99 readings, the most negative reading is equal to the *on* reading and the most positive reading is equal to the *off* reading.		
120 readings per cycle (60 readings per second):		
1.5 on	250 mSec On Delay	Filters out 15 most negative readings
0.5 off	100 mSec Off Delay	Filters out 6 most positive readings
On/Off GPS Sync setup for 1 second cycle		
A minimum/maximum reading from a sample of readings. Of the remaining 99 readings, the most negative reading is equal to the *on* reading and the most positive reading is equal to the *off* reading.		
A snapshot of readings in a certain time period:		
0.7 on	200 mSec On Setup	Takes reading 200 mSec before the *off* cycle.
0.3 off	150 mSec Off Delay	Takes reading 150 mSec into the *off* cycle.
0.8 on	200 mSec On Setup	Takes reading 200 mSec before the *off* cycle.
0.2 off	100 mSec Off Delay	Takes reading 100 mSec into the *off* cycle.
On/Off High/Low setup for 1 second cycle		
A minimum/maximum reading from a sample of readings. Of the remaining 45 readings, the most negative reading is equal to the *on* reading and the most positive reading is equal to the *off* reading.		
1.5 on	250 mSec On Setup	Takes reading 250 mSec before the *off* cycle.
0.5 off	250 mSec Off Delay	Takes reading 250 mSec into the *off* cycle.

Table A-1. Suggested On/Off Settings (continued)

On/Off GPS Real-time setup for greater than 2 second cycle		
8.0 on	200 mSec On Delay	Starts reading 200 mSec into *on* cycle (off-to-on).
2.0 off	250 mSec Off Delay	Starts reading 250 mSec into *off* cycle (on-to-off).
GPS-RT Setup Time	50 mSec	No readings 50 mSec before *off* cycle to *Off Delay*. No readings 50 mSec before *on* cycle to *On Delay*.
Recommended *GPS-RT Setup Time* is 50 mSec for Mercury switches and 30 mSec for solid state switches.		

Notes

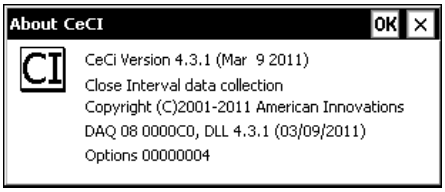
B

FAQs

This chapter provides answers to frequently asked questions (FAQs) about the Allegro Field PC and AI Allegro software. If you have a question not covered in this chapter, contact Technical Services at pcstechservices@aiworldwide.com.

How do I determine which version of software is installed on the Allegro?

The software version is listed in the *About* window of each AI software. For example, start CeCi and then tap **View** > **About CeCi**. The first line of information identifies the software version as shown in the next example.



How do I get the latest version of software available for the Allegro?

Contact Technical Services at pcstechservices@aiworldwide.com for a *User Name* and *Password* to access files for download.

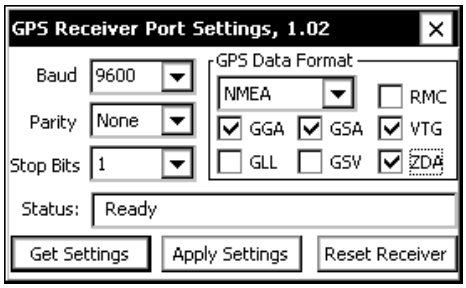
I have a Trimble GPS receiver connected to the Allegro with successful communication established between the two. Why does the Allegro show HiLo mode instead of GPS mode?

Using an external GPS receiver with the Allegro is referred to as *dual GPS*. Although the Allegro and external GPS are communicating, the following items must also be set up on the Allegro:

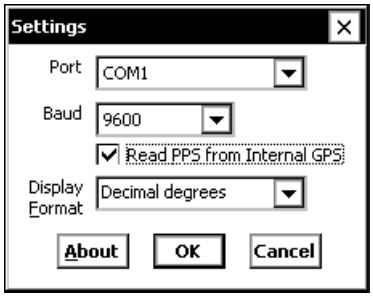
- GPS patch antenna is plugged in the *GPS ANT* connector on the Allegro.

  The Allegro includes an internal GPS module that uses the patch antenna to acquire a GPS timing signal from the satellite. If the GPS timing signal is unavailable, the Allegro operates in *HiLo* mode instead of *GPS* mode.

- *GPS Pod Setup* is set correctly for dual GPS. Tap *Start* > *File Explorer* > *My Device* > *Storage* > *Program Files* > *GPSPodSetup* and verify settings match those shown in the next figure.



- *GPS Status* is set correctly for dual GPS. Tap *Start* > *GpsStatus* > *Options* and verify settings match those shown in the next figure.



How do I enlarge the font size or change the touchscreen brightness and contrast settings?

To increase or decrease the font size

1 Tap **Settings** > **System** tab > **Screen** > **Text Size** tab.

2 Move the slider to increase or decrease text size. To change text size and font in a PS survey file tap **View** > **Fonts**.

To change the backlight brightness

1 Tap **Settings** > **System** tab > **Backlight** > **Brightness** tab.

2 Press <**Orange**> <**F5**> keys simultaneously to increase the contrast and brightness. To decrease the contrast and brightness, press <**Orange**> <**F4**> keys simultaneously.

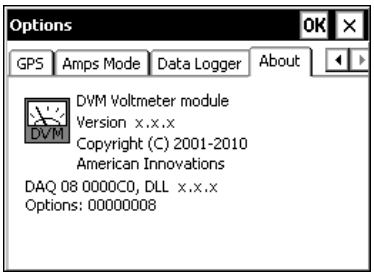
How do I find the version number of the DVM card?

To determine the version of the DAQ card:

1 Run any of the AI Allegro software. For example, double-tap the **AI-DVM** icon on the Allegro desktop.

2 Tap **Options** > **About** tab to display the *About* window and view the DAQ card version. The voltage range supported by the various DAQ card versions is identified in the following list:

- **150V maximum:** DAQ FF and DAQ 0B
- **250V maximum:** DAQ 08, DAQ 09, and DAQ 0A

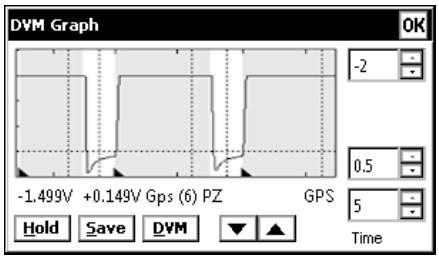


Based on the version of the DAQ card, AI Allegro software reads and sets the maximum voltage as 150V or 250V.

How can I verify interruption or make timing adjustments to ensure the Allegro is capturing the correct Structure P/S and Structure IRF at the correct time?

Start AI-DVM to complete the following steps:

1. Tap **Options** > **On/Off** tab > **Enable On/Off mode**.
2. Set up on/off settings and then tap **OK**.
3. Tap **Graph** to view a waveform of on/off readings as shown in the next example. For more information, see *DVM Graph Overview* (page 27).



What can I do if I cannot get a GPS satellite fix?

Verify the following settings are correct:

- Run the GPS Status software and verify COM port settings are correct.
- Run the GPS Pod Setup software and verify settings are correct. All software must be closed before viewing settings in GPS Pod Setup.
- Verify the GPS antenna has a clear view of the sky and is securely connected to the Allegro.

Why are GPS coordinates not recording in my Periodic Survey file?

Verify the cursor is in a reading field in the bottom pane of the survey file. Tapping a reading field places the cursor in the field.

Why is the Insert GPS command unavailable for selection in the Periodic Survey software?

Verify the GPS Status software is running and the cursor is in a reading field in the bottom pane of the survey file. Tapping a reading field places the cursor in the field.

Why does CeCi switch to Hi-Lo mode when my survey file is set up with GPS Sync or GPS Real-Time mode?

CeCi automatically switches to Hi-Lo mode when the Allegro loses the internal GPS time signal. When setting up a survey file in GPS Sync or GPS Real-time mode, AI recommends that you also set up the survey file in Hi-Lo mode.

Why do on/off readings look incorrect in CeCi?

- Run the AI-DVM software and view the waveform graph. Use the graph to verify satellite communication and on/off settings are correct.
- View the AI-DVM waveform graph several times before taking survey readings. This allows you to change on/off delay times as needed to get the best on/off capture.

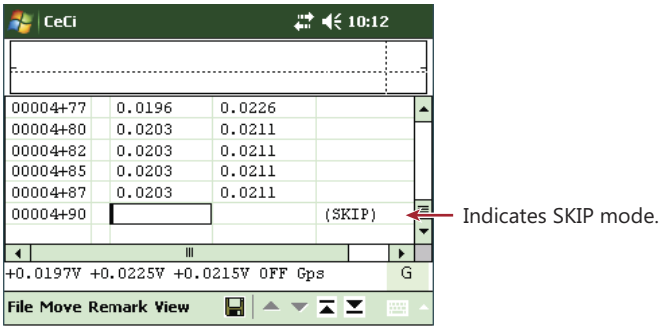
How do I include Remarks and GPS coordinates in a CeCi survey file when using Skip/Lock/Normal mode?

The following procedure applies to a CeCi survey set up in Fixed Increment mode. If you want to view the center line (CL) in a skipped section, verify the survey file is also set up with the option Retain Skipped records in Skip Mode (View > Options > File tab).

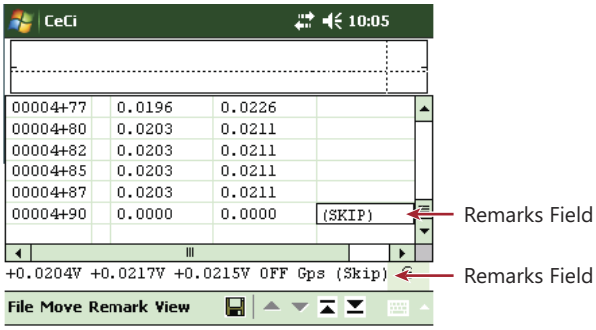
Complete the following steps:

1. Place the cursor in the pipe-to-soil (P/S) field and then press <**Ctrl**> <**Z**> or tap **Move** > **Skip/Lock/Normal**.

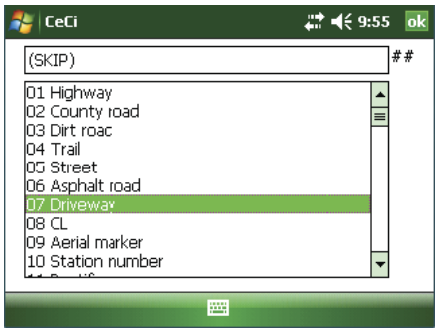
   Pressing <*Ctrl*> <*Z*> toggles *Skip*, *Lock*, and *Normal* modes. In *Skip* mode, CeCi inserts (SKIP) in the Remarks field of the selected survey record.



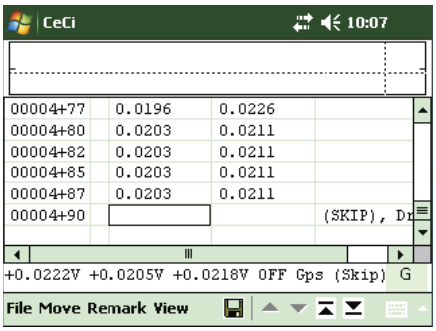
2 Move the cursor to the *Remarks* field by tapping the field or pressing the **Tab** button (right arrow).



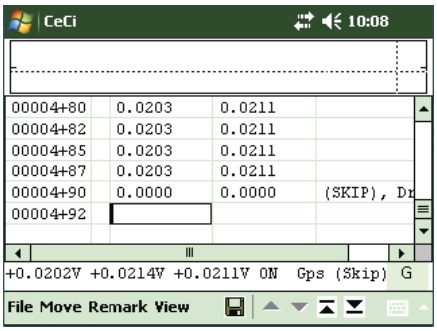
3 Tap **Remark** to open the *Remarks* window. Select and then double-tap the remark to insert it in the survey record and close the window.



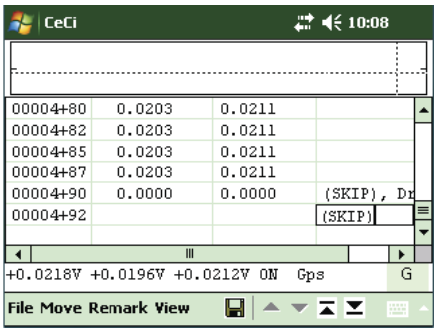
4 Press **Enter** to move the cursor to the *P/S* field.



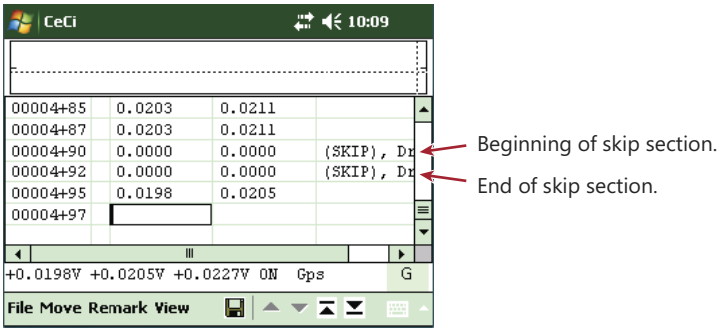
5 Press the down arrow to move the cursor to the next station number (SN). Continue to survey to the other end of the *SKIP* (such as a road crossing, railroad crossing, exposed pipe, and so on).



6 Press <**Ctrl**> <**Z**> to toggle from *SKIP* to normal mode. Move the cursor to the *Remarks* field and add another remark.



7 Press **Enter** and then the **down arrow** to move to the next SN and take a reading.



The survey file contains information shown in the image on the next page, including GPS coordinates when using GPS.

```
485.000    0.0203  0.0211
487.500    0.0203  0.0211
490.000    0.0000  0.0000 {G 30.43346596,-97.75916290, 931.7, 1.970} {T 06/01/2011, 10:03:14g} (SKIP), Driveway
492.500    0.0000  0.0000 {G 30.43345070,-97.75916290, 921.9, 2.000} {T 06/01/2011, 10:05:50g} (SKIP), Driveway
495.000    0.0198  0.0205
```

Notes

C Utility Software

Information in this chapter explains how to use and set up the following utility software:

- GPS Status (page 87)
- GPS Config (page 93)
- Save System (page 95)
- Set DAQ Registry Keys (page 96)

GPS Status

Use GPS Status (Figure C-1) to perform any of the following tasks:

- view current GPS data, such as number of satellites in view, GPS coordinates, amount of time since the last GPS fix, and current GPS time.
- enable the *Offset* option to view the distance between two points.
- enable the *Beep* option if you want the Allegro to beep when GPS readings update.
- set a *Display Format* for GPS coordinates (degrees and minutes or decimal degrees).
- change COM port and baud rate settings for a second GPS receiver (dual GPS).
- set up the Allegro to use the PPS timing signal received by the internal GPS module instead of a second GPS receiver.
- copy GPS coordinates to the system clipboard or an opened PTab spreadsheet file.

To start GPS Status, double-tap the GpsStatus icon on the Allegro desktop to display the *Gps Status* window shown below. See Table C-1 on page 88 for additional information.

NOTE: If the Allegro is unable to open the COM port, the message *Unable to open GPS port COM3 (-2,317)* displays. Exit and then restart GPS Status to allow the Allegro to open the port. The value shown in parentheses is an internal code used by AI for troubleshooting purposes.

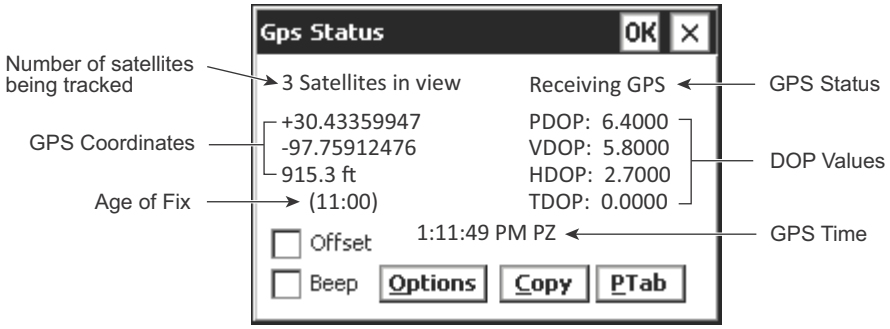


Figure C-1. GPS Status

Table C-1. GPS Status Field Descriptions

Field	Description
Satellites	Current number of satellites tracked by the GPS receiver display in this status line. If using dual-GPS, status line displays the number of satellites as *#/# Satellites in view*. The first number applies to the external GPS receiver, the second number applies to the internal GPS receiver. Three (3) satellites are required for coordinate calculations. Four (4) satellites are required for calculating a 3D position (latitude, longitude, and elevation). The more satellites tracked, the higher accuracy of the GPS receiver.

Table C-1. GPS Status Field Descriptions (continued)

Field	Description
GPS status	Status line may include any of the following messages: • Receiving GPS • Initializing • Waiting Information about the serial connection displays in parentheses during the startup process, such as *Initializing (V 236)*. It shows a GPS status byte (V or FF) and the number of received characters. GPS status bytes (V and FF) indicate whether or not the receiver is receiving GPS packets. *V* indicates valid GPS packets received and *FF* indicates no GPS packets received. If received characters is zero (0) or does not increase, verify the GPS receiver is securely connected to the Allegro and communication settings are correct (COM port and baud rate).
GPS coordinates	Shows longitude, latitude, and elevation coordinates received from a minimum of 3 satellites. Coordinates update every second. With a clear view of the sky, GPS accuracy without differential correction is about 10 meters (32.8 feet). Sub-meter accuracy is reported after applying differential correction when using a second GPS receiver (dual GPS), such as the Trimble GPS Pathfinder Pro XR.
DOP values	DOP (dilution of precision) values identify the accuracy of GPS readings. When a DOP value is zero (0), the GPS receiver does not report the value. When the value is between 1 and 3, GPS accuracy is good. *PDOP* refers to position dilution of precision; *VDOP* refers to vertical dilution of precision; *HDOP* refers to horizontal dilution of precision; and *TDOP* refers to time dilution of precision.

Table C-1. GPS Status Field Descriptions (continued)

Field	Description
Age of fix	Shows the time since the last GPS satellite fix. *Age of fix* appears only when the GPS satellite signal is lost. It appears ten seconds after losing the satellite signal. Information displays in the following manner: • When age is less than 10 seconds, field is empty. • When age is less than 1 minute, number of seconds display as *nn sec*, such as *35 sec*. • When age is less than 60 minutes, number of minutes and seconds display as *mm:ss*, such as *12:14*. • When age is undetermined, an asterisk (*) displays.
GPS time	GPS time displays when a GPS time signal is received and the *Offset* option is disabled. Updates display every second when GPS time is available. GPS time displays in 24-hour format and may include the suffix letters *P* and/or *Z*. *P* indicates a PPS (one pulse-per-second) time signal is being received. *Z* indicates a GPS time packet is being received. When GPS time is unavailable or the GPS time signal is more than 10 minutes old, this area of the GPS Status window is empty. When *Offset* is enabled, offset values (such as 2, 1, 5) or asterisks (*, *, *) display instead of GPS time.
Offset	*Offset* shows the distance between two points. To use *Offset*, tap **Offset** and then move to a different location. Offset values display inside parentheses and are calculated as feet or miles. For example, with an offset of (1, 2, 3): • 1 is the east-west offset (W positive). • 2 is the north-south offset (N positive). • 3 is the vertical offset. An offset distance higher than 0.1 degree (about six miles) displays as asterisks inside parentheses (*,*,*). When *Offset* is enabled, GPS time does not display.

Table C-1. GPS Status Field Descriptions (continued)

Field	Description
Beep	If you want the Allegro to beep each time GPS readings update, tap **Beep** to enable the option.
Options	Tap **Options** to set the following parameters for a second GPS receiver (dual GPS): • Select a COM port and baud rate. • Tap **Read PPS from Internal GPS** if you want to use the Allegro internal GPS module for the PPS timing signal. • Select a GPS display format (*Degrees and Minutes* or *Decimal degrees*).
Copy	Tap **Copy** to copy coordinates to the system clipboard or an opened PTab spreadsheet file.
PTab	Tap **PTab** to paste GPS coordinates in an active cell of an opened PTab file.

GPS Status Shortcut Keys

Shortcut keys listed in the following table (Table C-2) are an alternate method for using certain commands in AI-DVM. Use the Allegro keypad to run any of the following commands.

Table C-2. AI-DVM Shortcut Keys with Touchscreen Disabled

Command	Shortcut Keys	Description
Navigating GPS Status Software	<Tab>, <Enter>, and <Up/Down Arrows>	Press <Tab> to move cursor from one field to another. Press <Enter> to open or close a drop-down list. Press <Up/Down Arrows> to move cursor in a drop-down list; press <Enter> to select an option in a drop-down list.
Enable/Disable Read PPS from Internal GPS	<P>	Move cursor to *Read PPS from Internal GPS* in *Options* and then press <P> to enable or disable the option.
Apply / Cancel Changes	Ok / Cancel	Move cursor to <Ok> or <Cancel> and then press <Enter>. Ok applies changes, Cancel cancels changes.

GPS Config

GPS Config allows you to change the default datum selection (WGS-84) and default acquisition method (Compromise) used by the internal GPS modem to acquire a GPS satellite fix. WGS84 is considered the worldwide standard and is typically the default setting for most GPS receivers. If you are uncertain which datum to select, contact Technical Services for assistance.

The following list provides a description of the acquisition methods available for selection:

- **Accuracy:** This method requires better satellite positioning and strong signals. Position fixes are more accurate however satellite fixes occur less often.
- **Signal Acquisition:** This method provides satellite fixes in a wider range of conditions. It accepts a higher level of position uncertainty to provide satellite fixes more often.
- **Compromise:** This method compromises between *Accuracy* and ease of *Signal Acquisition*.

Complete the following steps to set the GPS datum and signal acquisition method:

1. Double-tap **My Computer** > **C_Drive** > **BTS** > **Apps** > **GpsConfig** to display the *Gps Configuration* window.

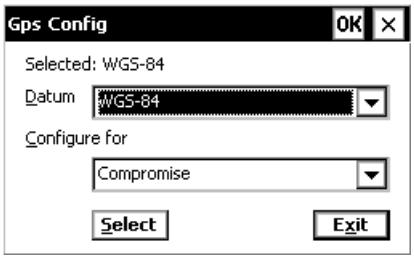


Figure C-2. GPS Configuration

2. Click the drop-down arrow in the **Datum** field and select an option in the list.
3. Click the drop-down arrow in the **Configure for** field and select an option in the list (*Accuracy*, *Signal Acquisition*, or *Compromise*).
4. Click **OK** to close the *GPS Configuration* window.

GPS Pod Setup

GPS Pod Setup sets communication parameters for the internal GPS module. The Allegro ships from AI with communication parameters already set. However, when you perform a *Power Reset* to reset the Allegro, the internal GPS module loses these settings.

Complete the following steps to set up communication parameters for the internal GPS module after performing a *Power Reset*:

1 Double-tap **My Computer** > **C_Drive** > **C_Program Files** > **GPSPodSetup** to display the Gps *GPS Receiver Port Settings* window.

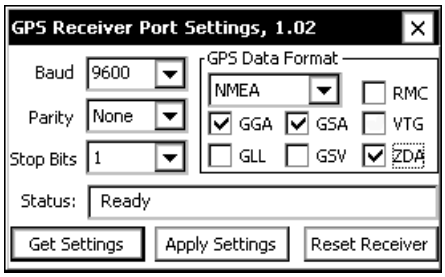


Figure C-3. GPS Receiver Port Settings

2 Tap **Get Settings** and complete the following steps:

a Click the drop-down arrow in the *Baud* field and select **9600**.

b Click the drop-down arrow in the *Parity* field and select **None**.

c Click the drop-down arrow in the *Stop Bits* field and select **1**.

d Click the drop-down arrow in the *GPS Data Format* field and select **NMEA**.

e Enable the options **GGA**, **GSA**, and **ZDA**.

GGA provides positioning data (latitude, longitude, north or south; *GSA* provides DOP (dilution of precision); and *ZDA* provides date and time.

3 Tap **Apply Settings** and then the Close icon (**X**).

Save System

Save System automatically runs after installing or upgrading AI Allegro software. It saves registry settings, runs the *Reset System* utility software, and then reboots the Allegro. When the process completes and the Allegro desktop displays, turn the Allegro *off* and then *on* again.

Run Save System when you change option or preference settings in any of the AI Allegro software or install new software on the Allegro.

To run Save System, follow these steps:

1. Tap **Start** > **Programs** > **Utilities** > **Save System** to display the *Save System* window and begin the process (Figure C-4).

   During the process the following messages display:

   - Saving Registry
   - Saving Files
   - Saving Databases

2. When Save System completes and the Allegro desktop displays, turn the Allegro **Off** and then **On** again.

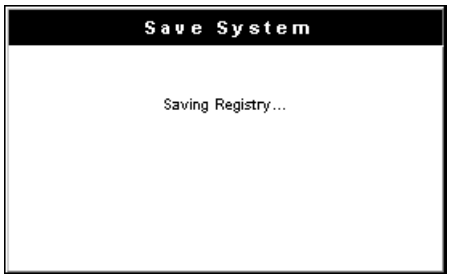


Figure C-4. Save System

Set DAQ Registry Keys

When the Allegro is unable to recognize the DVM DAQ card (digital voltmeter card), any of the following error messages may display when turning on the Allegro or using AI software. Use Set DAQ Registry Keys to recreate DAQ registry keys on the Allegro when any of the following error messages display:

- Unidentified PC card adapter
- DAQ card unavailable
- Error 55 (when starting DVM software)

To run Set DAQ Registry Keys, follow these steps:

1. Double-tap **My Computer** > **C_Drive** > **BTS** > **Apps** > **SetDaqRegKeys**.
2. Click **OK** when the following message displays.

Figure C-5. Set Daq Reg Keys Message

Notes

GPS Receivers

D

Information in this chapter explains how to set up a Holux and Trimble GPS receiver for use with the Allegro. Topics include:

- Set Up a Holux GPS Receiver
- Install GPS Controller Software (page 100)
- Set Up GPS Receiver (page 101)

Set Up a Holux GPS Receiver

The following procedure explains how to use the GPS Status software to set up a Holux GR213 receiver modified by Juniper Systems for use with the Allegro.

Complete the following steps:

1. Connect the Holux receiver in **COM 1** of the Allegro using the cable provided with the receiver.
2. Press the Allegro power button to turn on power.
3. Double-tap the **GPS Status icon** on the Allegro desktop and then tap **Options**.

4 Tap the drop-down arrow in the *Port* field and select **COM1** (Figure D-1).

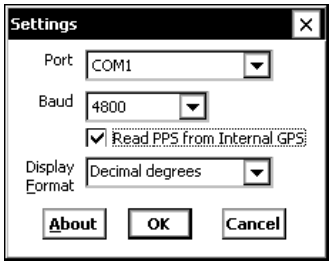


Figure D-1. GPS Status

5 Tap the drop-down arrow in the *Baud* field and select **4800**.

6 Tap **Read PPS from Internal GPS** to enable the option and place a check mark inside the option box.

7 Tap the drop-down arrow in the *Display Format* field and select either **Degrees and Minutes** or **Decimal degrees**.

NOTE: The data format output by the Holux receiver is NMEA at 4800 baud, 8 data bits, no parity, and 1 stop bit. The receiver uses the WGS84 Datum.

Install GPS Controller Software

The installation CD provided with the GPS receiver includes a copy of Trimble's GPS Controller software. You can also download a copy from the Trimble website at http://www.trimble.com.

NOTE: GPS is an acronym for Global Positioning System.

Complete the following steps to install GPS Controller on the Allegro:

1 Connect the Allegro to your computer using the provided USB cable.

2 Start Windows Mobile Device Center or ActiveSync. If using ActiveSync, click **No** when prompted to create a *Partnership*. This creates a *Guest* connection instead.

3 Insert the Trimble installation CD in the CD drive of your computer.

4 Double-click the file labeled **GPSControllerWinCESetup.exe** to begin the software installation.

5 Follow on-screen prompts to install the software.

Set Up GPS Receiver

The procedure in this section explains how to set up any of the following Trimble GPS receivers using the GPS Controller software:

- GPS Pathfinder XB
- GPS Pathfinder ProXH Receiver
- GPS Pathfinder ProXRT Receiver
- GPS Pathfinder ProXT Receiver

NOTE: If the GPS receiver uses Bluetooth for communication, also refer to *Save System* on page 95 for additional information.

Complete the following steps:

1 Connect the GPS receiver in **COM2** of the Allegro using the serial cable provided with the receiver.

2 Press the power button on both the Allegro and the GPS receiver to turn **On** the devices.

3 Complete the following steps at the Allegro:

   a Tap **Start** > **GpsStatus** > **Options** and select **COM2** in the *Port* field and **9600** in the *Baud* field. Tap **OK** to close the window. Tap **OK** again to return to the Allegro desktop.

b Double-tap the GPS Controller icon on the Allegro to display the *Skyplot* window (Figure D-2).

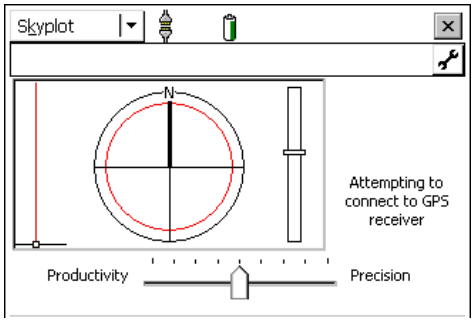


Figure D-2. Skyplot

4 Tap **Skyplot** > **Setup** > **GPS Settings** (Figure D-3).

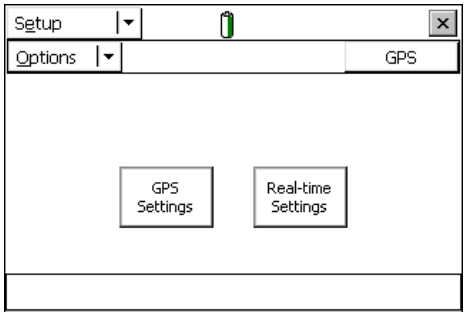


Figure D-3. Setup Options

5 Tap the drop-down arrow in the *GPS Receiver Port* field and select COM2: Serial Port COM2 (Figure D-4). Scroll down the window and set up the following fields as follows. When you finish, tap **OK** to return to the *Setup* window (Figure D-3).

- Velocity Filter: Auto
- Receiver Power Output: On
- NEMA Output: On

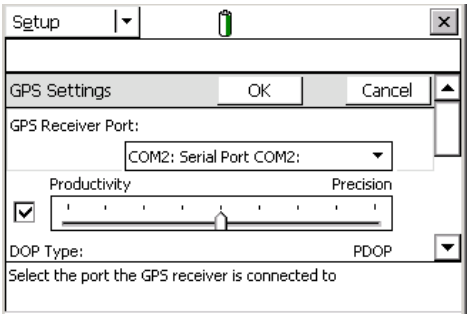


Figure D-4. Setup GPS Settings

6 Tap **Options** > **Connect to GPS**. When the Allegro emits an audible sound and a satellite icon displays near the *Setup* menu, the GPS receiver has connected to the satellite (Figure D-5).

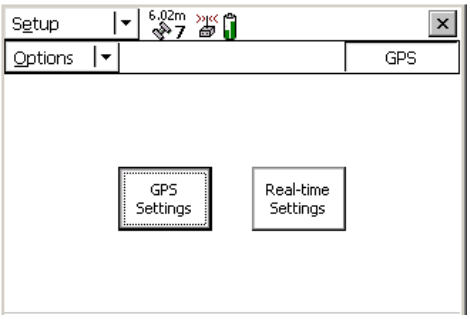


Figure D-5. Setup Options

7 Tap **GPS Settings** and then scroll to the bottom of the window. Tap the wrench icon in the *NEMA Output* field to display the *Setup NMEA Output Settings* window (Figure D-6).

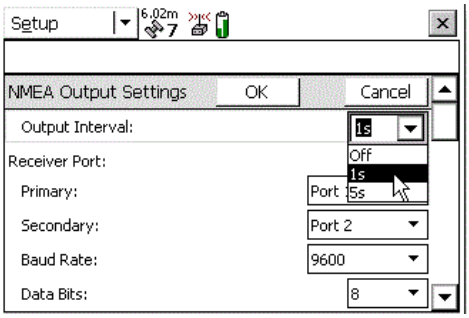


Figure D-6. Setup NMEA Output Settings

8 Set up fields in the *Setup NMEA Output Settings* window using information in the next table (Table D-1). When you finish, tap **OK**. Tap **OK** again to return to the *Setup Options* window (Figure D-5).

Table D-1. NMEA Output Settings

Field	XRT	XB	XH	XT
Output Interval	1s	1s or 5s	1s or 5s	1s or 5s
Primary	Port 1	Bluetooth	Serial	Serial
Secondary	Port 2	None	Bluetooth or None	Bluetooth or None
Baud Rate	9600	9600	9600	9600
Data Bits	8	8	8	8
Stop Bits	1	1	1	1
Parity	None	None	None	None
General	Select GGA and ZDA for all GPS receivers.			

9 Tap **Real-time Settings** to display the *Setup Real-time Settings* window (Figure D-7).

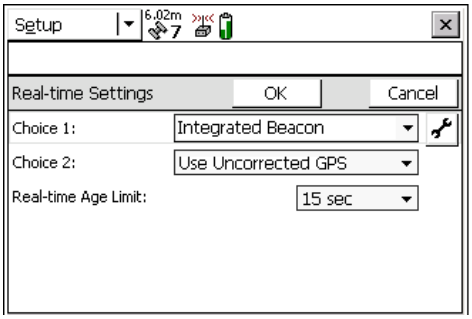


Figure D-7. Real-time Settings

10 Set up fields in the *Setup Real-time Settings* window using information in the next table (Table D-2). When you finish, tap **OK** to return to the *Setup Options* window (Figure D-5).

Table D-2. GPS Real-time Settings

Field	Setting
Choice 1	Integrated Beacon
Choice 2	Use uncorrected GPS
Real-time Age Limit	15 seconds

11 Click **Setup** > **Skyplot** to view GPS satellite information.

12 Tap **Skyplot** > **Setup** > **Options** > **Disconnect from GPS**. Tap **Yes** when the following message displays: *Are you sure you want to disconnect from the GPS receiver?*

13 Tap the Close icon (**X**) to exit the GPS Controller software.

Notes

Export Control Classification Number

The Export Control Classification Number (ECCN) assigned to American Innovations' Allegro software by the U.S. Bureau of Industry and Security (BIS) is as follows

- ECCN Classification: No Classification
- ECCN Code: EAR99 or NLR

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American Innovations Allegro CX v4.3.2 Keyboard Shortcuts

Global Shortcuts

Caps Toggle	<**Blue**><**CapLk**>	Toggles caps lock on and off.
Display Backlight	<**Gold**><**F3**>	Toggles backlight on and off.
Display Brighten/Dim	<**Gold**><**F4**> <**Gold**><**F5**>	Brightens or dims the screen display. Select GOLD shift key then F4 to dim, or F5 to brighten.
Move Between Fields and Buttons	<**TAB**>	Move cursor between fields and buttons. Left tab arrow moves cursor backward; right tab arrow moves cursor forward.
Move from One Tab to Another	<**Ctrl**><**TAB**>	Move from one tab to another in a window with multiple tab pages.
Open Drop-down List	<**Alt**><**Down Arrow**>	Press <Alt> and down arrow to open drop-down list.
Touchscreen	<**Blue**><**TS**>	Enable or disable touchscreen.
Windows Start Menu	<**Alt**><**Start**>	Open Start Menu.
Task Manager	Start	Open *Task Manager.*
Close Window	<**Esc**>	Close an open window. or cancel a function such as taking a reading.

AI-DVM

Graph	<**G**> or <**Alt**><**G**>	Open graph.
Copy / Paste	<**Ctrl**><**C**> <**Ctrl**><**V**>	Copy current DVM reading. Paste DVM reading in an open file, such as Excel.
Option Window	<**N**> or <**Alt**><**N**>	Open *Options* window.
Voltage Range	<**Ctrl**><**Up Arrow**> <**Ctrl**><**Down Arrow**> <**U**> or <**Alt**><**U**>	Increase voltage range. Decrease voltage range. Select autoranging.
VDC Test Function	<**D**> or <**Alt**><**D**>	Select Vdc test function.
VAC Test Function	<**A**> or <**Alt**><**A**>	Select Vac test function.
Amp Test Function	<**M**> or <**Alt**><**M**>	Select Amp test function.
Ohm Test Function	<**O**> or <**Alt**><**O**>	Select Ohm test function.
Diode Test Function	<**I**> or <**Alt**><**I**>	Select Diode test function.
Move Cursor Between Fields	<**TAB**>	Press <TAB> to move cursor from one field to another in DVM *Options* window.
Move Cursor in Drop-down List	<**Up/Down Arrows**>	Press up/down arrows to move cursor up and down in a drop-down list in DVM *Options* window.

AI-DVM

Accept Selection in Drop-down List	<**Enter**>	Press <Enter> to accept selection in a drop-down list in DVM *Options* window.
Enable or Disable Autoranging	<**A**>	Press <A> to enable or disable autorange option in DVM *Options* window.
Move Cursor to Sample Rate Field	<**S**>	Press <S> to move cursor to Sample Rate field in DVM *Options* window.
Display Graph Remarks	<**Tab**> <**Enter**>	Press <Tab> to move cursor to *Save* button in DVM graph window, then press <Enter> to display graph remarks window. Press <Enter> in graph remarks window to add a new line; press <Tab> to move cursor to *Ok* or *Cancel* and then press <Enter>.

CeCi

New	<**Ctrl**><**N**>	Create new survey file.
Open	<**Ctrl**><**O**>	Open *File Open* window.
Save	<**Ctrl**><**S**>	Save survey file.
Flag Marker	<**F**>	Insert flag marker in flagged mode.
Reset Flag Count	<**Ctrl**><**F**>	Reset flag count.
Gap Marker	<**G**>	Insert gap marker in flagged mode.
Capture Reading	<**Enter>**	Capture a reading.
First Record	<**Ctrl**><**Home**>	Move cursor to first record.
Last Record	<**Ctrl**><**End**>	Move cursor to last record.
Go To	<**Ctrl**><**G**>	Open *Go To Location* window.
Skip	<**Ctrl**><**K**>	Open *Skip Distance* window in Fixed Increment mode.
Insert Record	<**Ctrl**><**Ins**>	Insert new record.
Delete Record	<**Ctrl**><**Del**>	Delete selected record.
Remark	<**Ctrl**><**R**>	Open remark window.
Skip/Lock/Normal	<**F3**>	Toggles *Skip*, *Lock*, and *Normal* in Fixed Increment mode.
Pause/Resume	<**F5**>	Pause or resume timed readings.
Test Point Information	<**Ctrl**><**T**>	Open *Test Point Information* window.
Open File Menu	<**Alt**> <**F**>	Press <Alt> <F> to open *File* menu.

CeCi

Open Move Menu	<**Alt**> <**M**>	Press <Alt> <M> to open *Move* menu.
Open View Menu	<**Alt**> <**V**>	Press <Alt> <V> to open *View* menu.
Open Remark Window	<**Alt**> <**R**>	Press <Alt> <R> to open *Remark* window.
Navigating Misc Tab in Options	<**B**> <**V**> <**W**> <**D**>	Press <B> to enable or disable *Beep on every Reading*. Press <V> to move cursor to *Voltage level*. Press <W> to enable or disable *Beep when overwrite existing data*. Press <D> to enable or disable *Enable double-click detection*.
Navigating File Tab in Options	<**A**> <**I**> <**R**>	Press <A> to enable or disable *Autosave*. Press <I> to move cursor to *Interval (minutes)*. Press <R> to enable or disable *Retain Skipped records in Skip mode*.
Navigating GPS Tab in Options	<**C**> <**S**> <**G**>	Press <C> to enable or disable *Clear GPS Location After*. Press <S> to move cursor to *Seconds Without Updates*. Press <G> to move cursor to *GPS Display Format*.
Navigating Open and Save As Windows	<**Tab**> <**Up/Down Arrows**>	Press <Tab> to move cursor between fields. Press <Up/Down Arrows> to navigate list of files.
Navigating Graph Tab in Options	<**G**> <**U**> <**L**> <**W**>	Press <G> to enable or disable *Show Graph*. With *Show Graph* enabled: Press <U> to move cursor to *Upper Value*. Press <L> to move cursor to *Lower Value*. Press <W> to move cursor to *Width*.
Navigating Colors Tab in Options	<**E**> <**Tab**> <**Up/Down Arrows**> <**Home/End Arrows**>	Press <E> to enable or disable *Enable Color*. With *Enable Color* enabled: • Press <Tab> to move cursor between field selection list and color grid. • Press <Up/Down or Home/End arrows> to move cursor in field selection list or color grid.

American Innovations Allegro CX v4.3.2 Keyboard Shortcuts

Annual / Periodic Survey

Open	<**Ctrl**> <**O**>	Open *File Open* window.
Save	<**Ctrl**><**S**>	Save survey file.
Copy, Cut, Paste	<**Ctrl**><**C**>	Copy selection to clipboard.
	<**Ctrl**><**X**>	Remove selection and copy to clipboard.
	<**Ctrl**><**V**>	Paste content from clipboard.
Select Data in a Field	<**Shift**><**Home**>	Select data from the current cursor location to the end of the field.
	<**Shift**><**End**>	Select data from the current cursor location to the beginning of the field.
Undo	<**Ctrl**><**Z**>	Undo last change.
Next Page / Previous Page	<**Ctrl**><**Down Arrow**>	Display next page of a multi-page site.
	<**Ctrl**><**Up Arrow**>	Display previous page of a multi-page site.
Next Site / Previous Site	<**Shift**><**Down Arrow**>	Display next site.
	<**Shift**><**Up Arrow**>	Display previous site.
Record GPS Coordinates	<**F4**>	Records GPS coordinates when cursor is in reading field.
Insert GPS Coordinates	<**F5**>	Inserts GPS coordinates when cursor is in reading field.
Capture Reading	<**Enter**>	Capture a reading. Options include: • Select reading field and press <Enter> to activate digital voltmeter. Press <Enter> again to capture reading. • Select timed reading field and press <Enter> to set up, start, stop, or cancel timed reading mode.
Navigate Information and Reading Fields	<**Alt**> <**U**>	Press <Alt> <U> to move cursor between information and reading fields.
Open File Menu	<**Alt**> <**F**>	Press <Alt> <F> to open *File* menu.
Cancel Changes	<**Esc**> or <**Cancel**>	Press <Esc> or move cursor to <Cancel> button and press <Enter>.
Apply Changes	<**Enter**> or <**OK**>	Press <Enter> to accept a selection in a drop-down list. Or move cursor to <OK> button and press <Enter> to apply changes.
Move Cursor in Drop-down List	<**Up/Down Arrows**>	Press <Up/Down Arrows> to move cursor in a drop-down list.

DCVG

New	<**Ctrl**><**N**>	Create new survey file.
Open	<**Ctrl**><**O**>	Open *File Open* window.
Save	<**Ctrl**><**S**>	Save survey file.
Flag Marker	<**F**>	Insert flag marker in flagged mode.
Reset Flag Count	<**Ctrl**><**F**>	Reset flag count.
Gap Marker	<**G**>	Insert gap marker in flagged mode.
Capture Reading	<**Enter**>	Capture a reading.
First Record	<**Ctrl**><**Home**>	Move cursor to first record.
Last Record	<**Ctrl**><**End**>	Move cursor to last record.
Go To	<**Ctrl**><**G**>	Open *Go To Location* window.
Skip	<**Ctrl**><**K**>	Open *Skip Distance* window in fixed increment mode.
Insert Record	<**Ctrl**><**Ins**>	Insert new record.
Delete Record	<**Ctrl**><**Del**>	Delete record.
Remark	<**Alt**><**R**>	Open remark window.
Test Point Information	<**Ctrl**><**T**>	Open *Test Point Information* window.

GPS Status

Navigating GPS Status Window	<**Tab**>	Press <Tab> or <Up/Down Arrows> to move cursor between fields.
	<**Enter**> <**Up/Down Arrows**>	Press <Enter> to open or close a drop-down list. Press <Up/Down Arrows> to navigate options in drop-down list and then press <Enter> to select an option. Press <Up/Down Arrows> to navigate list of files.
Enable/Disable Read PPS from Internal GPS	<**P**>	Press <P> to enable or disable *Read PPS from Internal GPS*.
Apply / Cancel Changes	<**Ok**> / <**Cancel**>	Press <Ok> to apply changes or <Cancel> to cancel changes.
Navigating GPS Status Window	<**Tab**>	Press <Tab> or <Up/Down Arrows> to move cursor between fields.
	<**Enter**> <**Up/Down Arrows**>	Press <Enter> to open or close a drop-down list. Press <Up/Down Arrows> to navigate options in drop-down list and then press <Enter> to select an option. Press <Up/Down Arrows> to navigate list of files.